NOVEMBER, 1942

Rock Products

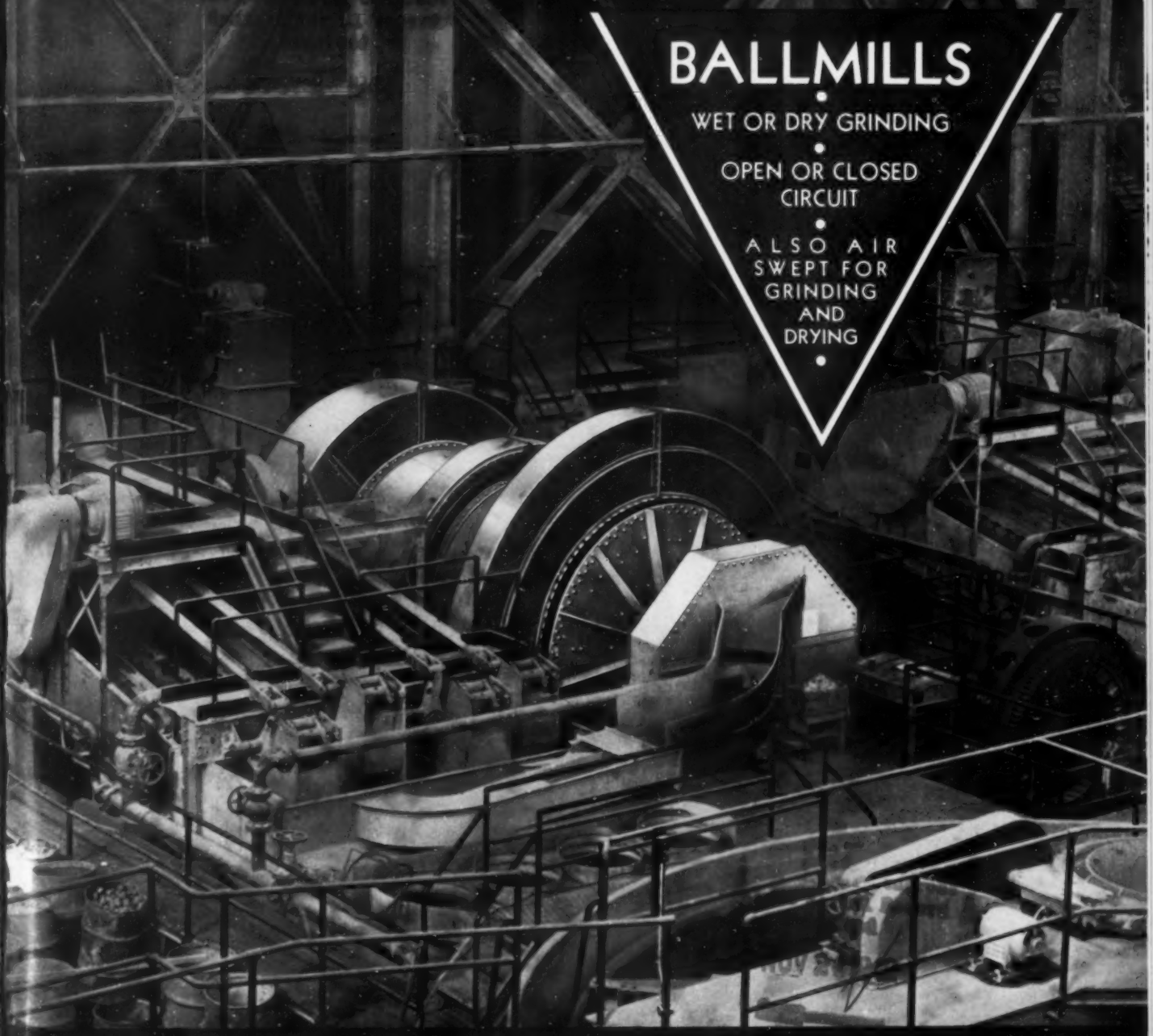
THE INDUSTRY'S RECOGNIZED AUTHORITY

BALLMILLS

WET OR DRY GRINDING

OPEN OR CLOSED CIRCUIT

ALSO AIR SWEPT FOR GRINDING AND DRYING



F. L. SMIDTH & CO.

60 EAST 42ND STREET

ENGINEERS
MANUFACTURERS OF BALLMILLS
SINCE 1895

NEW YORK, N. Y.

NOV 14 1942

©CIB 565446

"STEP UP PRODUCTION" is the thought of every patriotic American today——so

CRUSH IT IN ONE OPERATION

Open view of the Williams "Slugger" Crusher showing heavy duty hammers, liners and discs.

Use One Williams Hammer Crusher to do the Entire Job.....Thoroughly.....At Low Cost

SPEED plus satisfactory work is essential in America today. Along these lines the Williams "Slugger" Crusher and Pulverizer now makes it possible to crush large pieces of stone weighing from 75 to 100 pounds to 1¼", ¾" or agricultural limestone in One Operation. This not only eliminates costly sledging but also does away with the unnecessary expense of a primary crusher.

The "Slugger" represents the most advanced type of crushing equipment on the market today and with seven sizes to choose from producing from 4 to 30 tons per hour, every producer whether large or small can now afford to install a Williams.

The Williams Patent Crusher & Pulverizer Company
800 ST. LOUIS AVE. ST. LOUIS, MISSOURI

Williams Fine Grinding Equipment With Air Separation . . .

For faster, more efficient fine grinding of limestone, lime, coal, talc, etc., there is a Williams Roller Mill with Air Separator to fit your requirements. Finenesses from 100 to 400 mesh.

Williams also builds Impact Mills with Air Separation; Mechanical Air Separators for classifying finely ground material or taking the fines out of dry material.

THE WILLIAMS PATENT CRUSHER & PULVERIZER CO. ST. LOUIS, MO. U.S.A. TRADE MARK
REG. U.S. PAT. OFF.

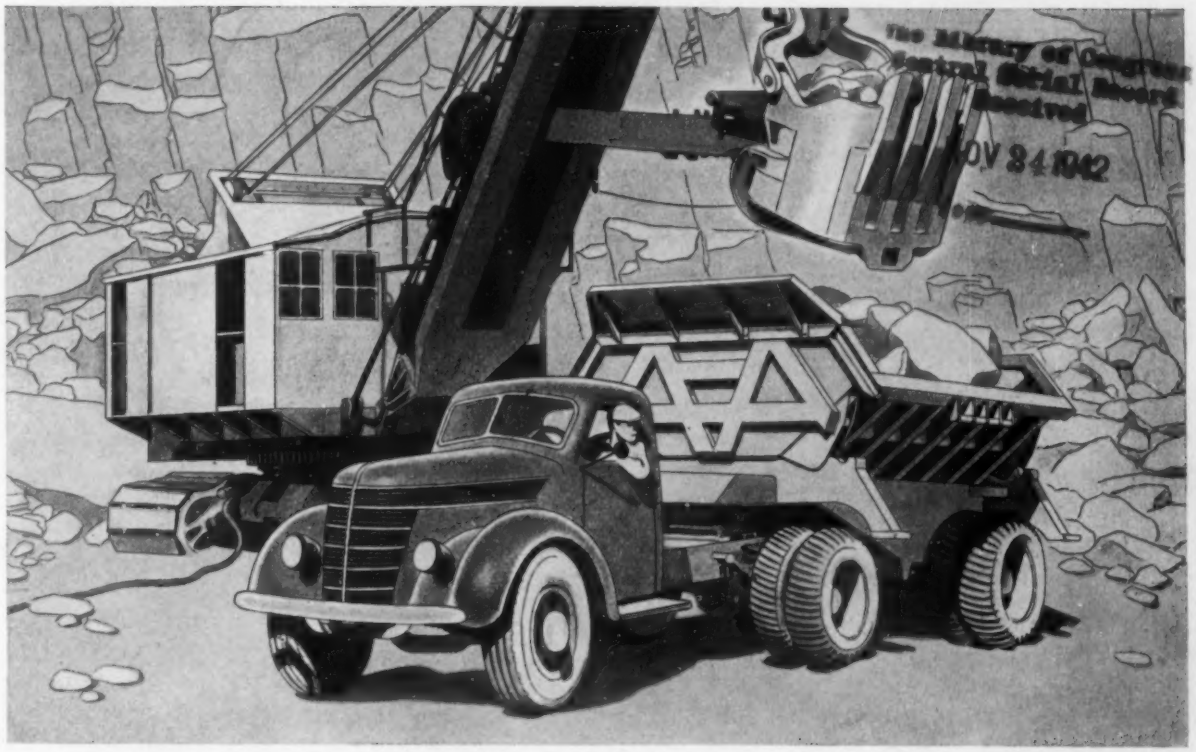
Williams

OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD

PATENT CRUSHERS GRINDERS SHREDDERS

ACHIEVEMENT

—measured in millions of tons!



SIX YEARS AGO a crushed-stone producer asked us to build the first semi-trailer for quarry haulage. The idea was new, untried, challenging!

EASTON engineers, experienced through many years of pioneering in all phases of track and trackless quarry haulage, were alert to the possibilities of this new idea. Through the semi-trailer they foresaw the application of lighter, low-cost truck units to heavy duty quarry service, with the consequent saving in tires, fuel and manpower. They foresaw the value of continuous shovel and crusher operation made possible through a steady flow of transportation. They foresaw the amazing new low costs per ton of rock hauled.

The first EASTON Semi-Trailer, of approximately 15-tons capacity, fulfilled all expectations. Our engineers continued to work on the patented basic design. Shock-proof dumping was made possible by means of stabilizer feet made to rest on the crusher-hopper wall as the body discharged its load. Thus the light truck chassis was relieved of the shock and strain of dumping. Designs were completed for units ranging from 10 to 25 tons capacity. Dumping was accomplished by hydraulic body hoist, or by EASTON overhead hoist at a fixed point. Other developments followed rapidly, as demanded by special operator requirements.

OVER 25 MILLION TONS A YEAR

Now, only six years after the first unit was built, the record of EASTON Semi-Trailers in quarry service stands unchallenged for high tonnage and low cost. Today, as your watch ticks off each second, a ton of rock is dumped from an EASTON Semi-Trailer into a crusher-hopper. Unknown six years ago, these big modern containers are now hauling a total combined annual payload estimated at over 25 million tons!

Today it is important to remember that many gallons of precious fuel, and many miles of tire service are being saved where EASTON Semi-Trailers were installed to replace more costly equipment. Also, many tons of valuable scrap were made available where EASTON Semi-Trailers replaced as many as nine steel cars per unit installed.

Certainly we are proud of our record of achievement. Yet, now, when wartime restrictions have reduced equipment orders to a minimum, we cannot rest on past accomplishments alone. To help in the conservation of useful equipment EASTON Engineers are cooperating with tractor and tire manufacturers in offering assistance to quarry operators. When you must have new equipment to replace completely worn-out old units EASTON will help you to cut through Washington red tape and get what you need.

For bigger payloads with less fuel, less rubber, less manpower "keep moving with EASTON". Write to Engineering Counsel, Easton Car & Construction Company, Easton, Pa. S-1001

EASTON

INDUSTRIAL CARS
TRUCK BODIES · TRAILERS
ELECTRIC LIFT TRUCKS

Member AUDIT BUREAU OF CIRCULATIONS
Member ASSOCIATED BUSINESS PAPERS

Rock Products

Volume 45 • November, 1942 • Number 11

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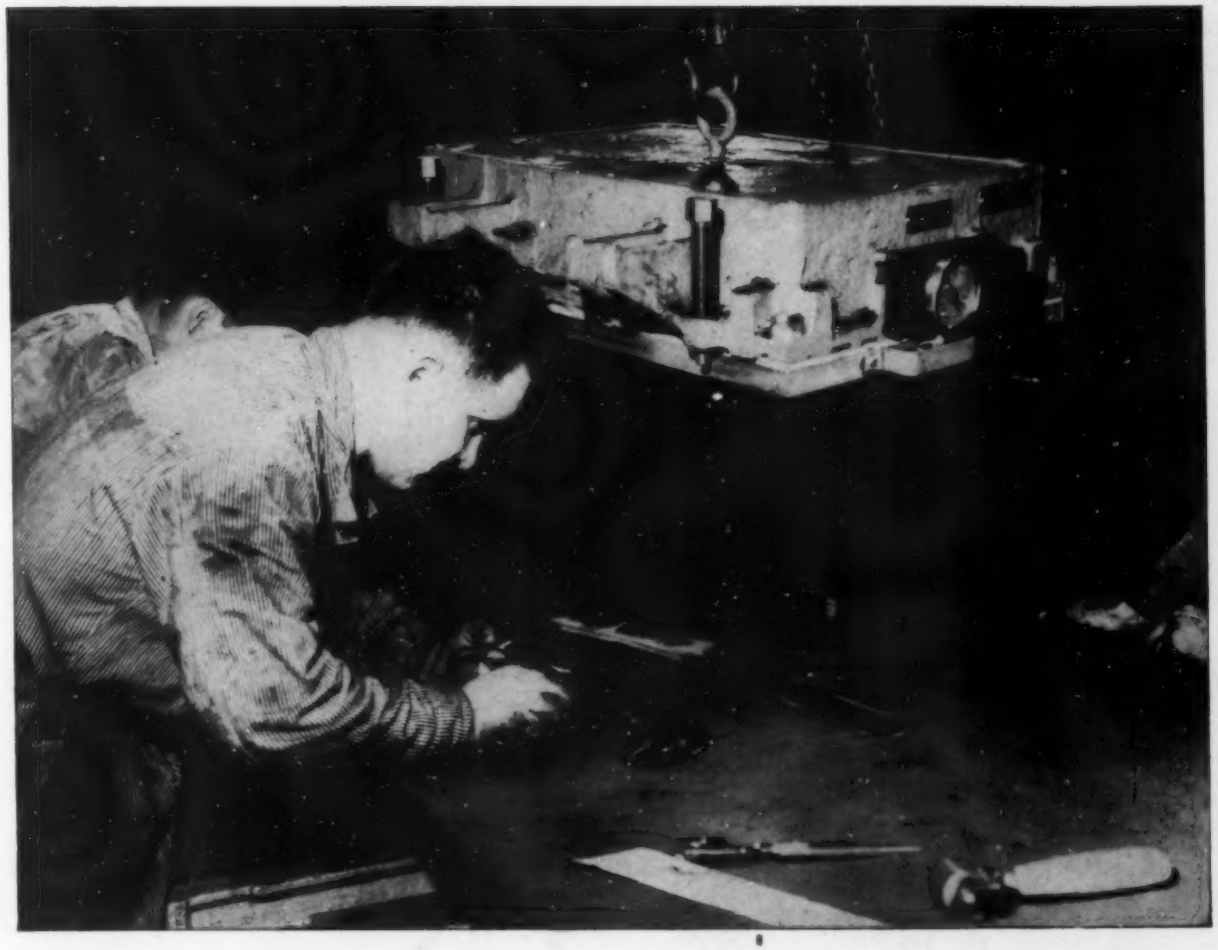


"Condemned" belt carried 3 million tons, saved 7900 lbs. of rubber and $3400

Another B. F. Goodrich suggestion to save rubber

THE man in the picture demonstrates how an injured conveyor belt is made ready for a vulcanized repair. One such belt which had been condemned as hopelessly damaged was repaired this way and since carried 3,808,000 tons . . . 7,900 pounds of rubber headed for the junk pile were saved and put back to work in industry . . . the belt owner saved more than $3,400.

That is the kind of result many belt users can expect from the B. F. Goodrich conservation program for rubber conveyor and transmission belts —a program that may help you save money, conserve rubber, and perhaps find belts *in your own plant* that priorities won't let you buy.

Years ago B. F. Goodrich developed the Plylock splice for making conveyor and transmission belts endless—often doubling life of belts where metal fasteners had been used. This splice is vulcanized by a portable electric vulcanizer so that the belt can be made endless in your plant or on the drive if desired.

Repairs in belts can be made by this same B. F. Goodrich method — the damaged plies are cut away, down to the good plies, rubberized repair fabric is cemented in, and the patch vulcanized. That's what was done with the "condemned" belt — 50 cuts and gouges were repaired, and the belt lasted 17 months.

Old, worn belts made into new

Many old belts, so worn and frayed as to seem useless, can be saved by this B. F. Goodrich development. Frayed edges can be trimmed off, worn top or bottom plies can be peeled off. If the belt is then too narrow or light for the original drive, it can be slit into two or more belts for narrower drives. These new-belts-from-old can then be made endless by the Plylock splice. Hundreds of such re-made belts are serving perfectly in plants today.

Most B. F. Goodrich distributors are thoroughly trained by years of experience to give you the benefits and savings of the Plylock method. Call the one nearest you, or write us. We'll send you, too, on request, a series of folders on how to conserve all industrial rubber goods in your plant and, if you are a user of conveyor belts, the Belt Maintenance Manual. *The B. F. Goodrich Co., Industrial Products Division, Akron, Ohio.*

B.F. Goodrich

FIRST IN RUBBER

DOUBLE MACHINERY LIFE..

. . BY KEEPING IT PROPERLY SERVICED !

From a business standpoint . . . keeping your machinery properly serviced makes it last about twice as long . . . doubles its output before replacement — lowers investment, depreciation, operating cost, increases your profits.

From a patriotic standpoint . . . it releases twice as many machines for our fighting forces . . . sorely needed machines!

It's easy to keep 'em repaired, too! You simply reach for your 'phone, call your dealer and in a short time he'll have your outfit fixed and back to work! In every territory, throughout the continent, there is an Allis-Chalmers dealer ready to give you quick, expert service and advice. When you have a problem, his knowledge and experience plus yours will quickly solve it. When you have a repair or rebuild job he'll furnish you the highest type mechanical skill, using genuine parts replacements. Dealer service is mighty valuable — use it to your fullest extent. Keep in close touch with your Allis-Chalmers dealer at all times. Let him help you keep 'em going!

Running a machine in need of repairs one day longer than you should may require 10 times as much critical material when you finally have it fixed—be many times as expensive. Protect your own interest . . . help the war effort — have your Allis-Chalmers dealer repair, replace, rebuild your outfits now.

ALLIS-CHALMERS
TRACTOR DIVISION · MILWAUKEE · U. S. A.

THROW YOUR SCRAP INTO THE FIGHT!

Contractor writes...

"TRUCKS CLEARED AND CLEANED READILY... FORMS STRIPPED CLEANER... WITH POZZOLITH (CEMENT DISPERSION)"

BURDINE CONSTRUCTION COMPANY
SHAW, MISSISSIPPI

April 6, 1942

The Master Builders Co.,
7016 Euclid Avenue,
Cleveland, Ohio.

Gentlemen:-

You may be interested in learning what our experience was with Pozzolith, cement dispersion material, on the Ordnance Depot at Milan, Tenn. where we supplied approximately 200,000 cubic yards of concrete. In approximately 40,000 cubic yards of this we used your Pozzolith.

It took about 12-15% less water to give the specified slump, yet we noticed that the concrete mixed as fast or faster, cleared the trucks readily, and the trucks cleaned easier at the end of the run.

We noticed that placing in the forms was helped by the good consistency of the mix and work stripped easier with less bleeding and segregation. Strengths ran higher.

Yours very truly,
Burdine Construction Company,
J. H. Burdine
J. H. Burdine-Owner.

Find out how Pozzolith reduces ready-mix costs 15 to 30 cents per yard. Write for illustrated booklet which tells how Cement Dispersion produces greater placing speed, workability, watertightness and durability.

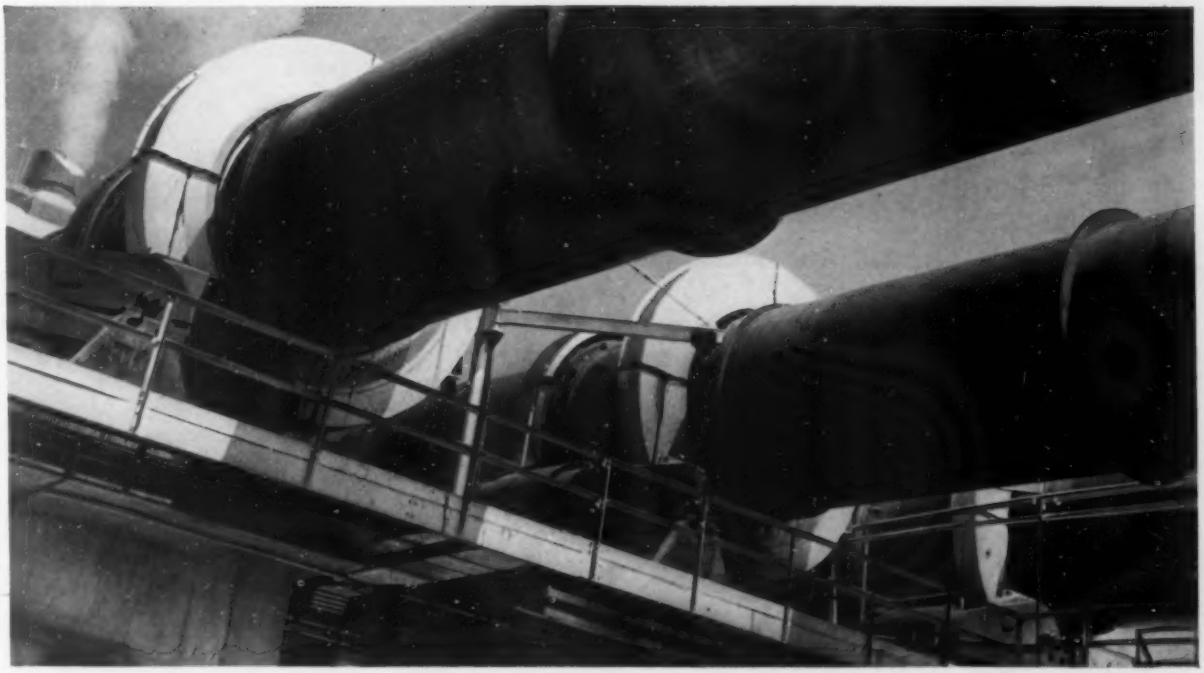
THE MASTER BUILDERS CO.
CLEVELAND, OHIO TORONTO, ONTARIO

MASTER BUILDERS

FIRST 6
in April 1941
THEN 6
in October 1941
ANOTHER 6
in
January 1942
Satisfied Customers
Assure REPEAT ORDERS
Smith-Mobile Truck Mixer users invariably come back for additional Smith-Mobiles. A typical case is Maxon Construction Company of Dayton, Ohio. Maxon's initial order in April 1941 called for 6 Smith-Mobiles. 6 more were ordered in October 1941 . . . another 6 in January of this year . . . and now they've ordered 40 additional units.
Surely, such figures are significant. The many Smith-Mobile repeat orders come as a result of satisfactory performance. Owners prefer the HIGH DISCHARGE without hoist . . . the CONTROLLED DISCHARGE without segregation . . . the VISIBLE MIXING feature . . . the successful REAR END CHARGING . . . the Smith way of introducing water through the feed opening. Above all, they appreciate Smith-Mobile's GREATER SPEED and EFFICIENCY. So play safe! Buy time-tested Smith-Mobiles. Ask for Catalog 198-B.
The T. L. SMITH CO., 2885 N. 32nd St., Milwaukee, Wis., U.S.A.
One of Maxon's 58 Smith-Mobiles Used on a Big U. S. Navy War Project.
...and Now
40
SMITH
USN
SMITH-MOBILE
The ORIGINAL HIGH DISCHARGE Truck Mixer and Agitator
A 3870-1P

TRAYLOR

KILNS ★ COOLERS ★ DRYERS



WE BUILD

Rotary Kilns
Rotary Coolers
Rotary Dryers
Rotary Slakers
Scrubbers
Evaporators
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
Grinding Mills
Ball Mills
Rod Mills
Tube Mills
Pug Mills
Wash Mills
Feeders
Rotary Screens
Elevators

The construction of Rotary Kilns, Coolers and Dryers requires more than mere quantities of several varieties of metal, if they are to perform efficiently and economically. There needs to be, (1), scientific designing by engineers intimately acquainted with the processes in which the machines are to be used and how they should function, and (2), expert workmanship in the building of the machines exactly to specifications, in order that the performance expectations of the process engineers be realized in abundant measure.

These are the principles underlying the unquestionable leadership of TRAYLOR in this field of endeavor,—a leadership conclusively proved by the decided and continued preference for Traylor Rotary Kilns, Coolers and Dryers on the part of the engineers of the world's "greatest" in the cement, lime, chemical, process and mining industries, and of hosts of the not-so-great too.

In these difficult, all-too-short days, our engineers are busier than is ordinarily to their liking, but they will find time, somehow, to consult with and advise potential users of Traylor Rotary Kilns, Coolers and Dryers. That's what they get paid for doing. Use them! Deliveries? Well, not so promising, considering that all materials going to make up the machines are most difficult to come at. But maybe, some way or other, we can serve you not too long from now. Why not write us about it?

SEE OUR BULLETIN No. 115

TRAYLOR

ENGINEERING & MANUFACTURING CO.

MAIN OFFICE AND WORKS — ALLENTOWN PENNA., U.S.A.

NEW YORK CITY 3416 Empire State Bldg. | CHICAGO 2051 One La Salle St. Bldg. | SALT LAKE CITY 101 West Second South St. | LOS ANGELES 919 Chester Williams Bldg. | SPOKANE S. 2707 Rhyolite Rd.

B. C. EQUIPMENT CO., LTD.
551 Howe St., Vancouver, B. C.

Export Department—104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, Sao Paulo, Rio de Janeiro, Buenos Aires, Santiago, Valparaiso, Antofagasta, Oruro, San Juan, P. R.

Working in a Nevada Gravel Pit, this A-W Twin-Unit Portable Crushing Plant maintained an average of 300 tons per hour, crushing 55% to 65% of the material to 1" minus.

A-W TWIN UNIT CRUSHING PLANTS

Set New Records for Consistent High Output

● The speed, efficiency and economical performance of these high output portable Austin-Western plants are the result of a combination of distinctive features.

The long stroke of the 10" x 36" Primary Crusher and its unusually deep jaws, operating at high speed, provide more square feet of crushing area per minute . . . with consequent faster reduction of the material. The deeper jaws, which are set at a more nearly vertical angle, insure a positive bite, eliminating "belching."

The 40" x 22" Secondary Roll Crusher, which is available with either one or both shells corrugated, takes large material at a high speed.

A Rotary Elevator, which carries all the oversize material back to the Roll Crusher without spillage, is an important factor in the consistently high output of these modern plants. Because of the unusual double screening arrangement, it is possible to produce four sizes of material simultaneously.

The heavier of the twin units weighs less than 40,000 pounds and has an overall width of only 8 feet; can readily be transported for economical "at the job" production.

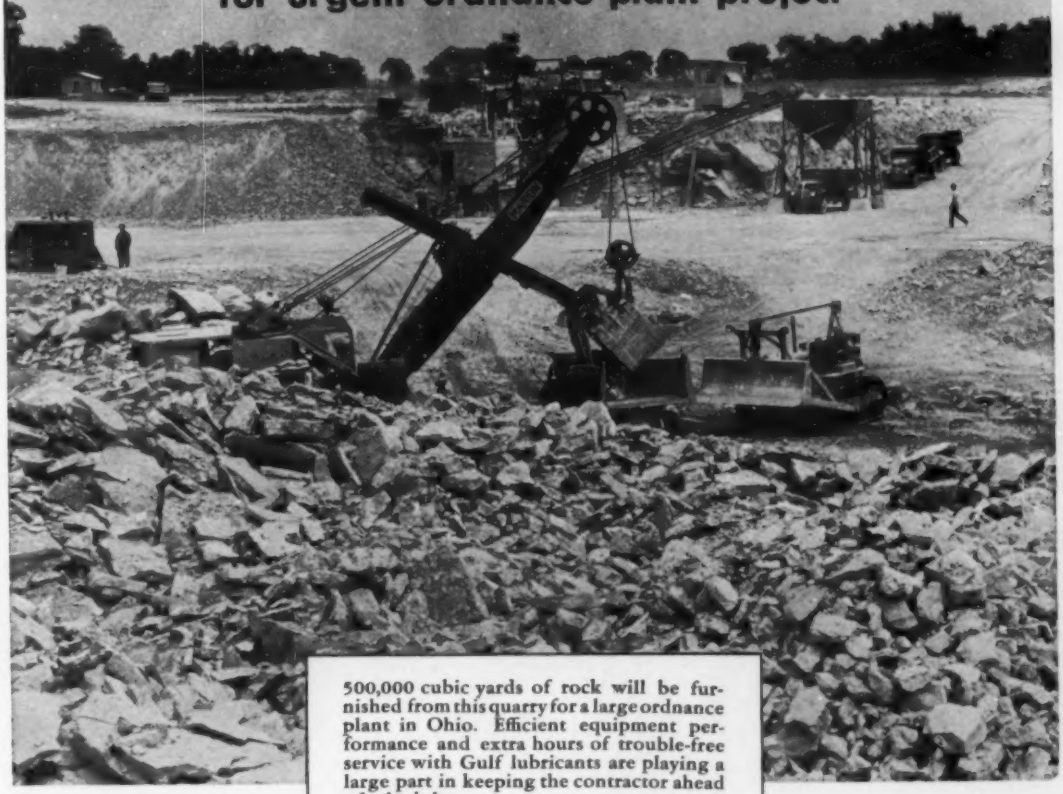
THE AUSTIN-WESTERN ROAD MACHINERY CO.
Aurora, Illinois

Austin-Western

MOTOR GRADERS • BLADE GRADERS • ELEVATING GRADERS • SCRAPERS • CRUSHING AND SCREENING PLANTS • ROLLERS
ROLL-A-PLANES • MOTOR SWEEPERS • SHOVELS AND CRANES • SCARIFIERS • DUMP CARS • TRAIL CARS

GULF QUALITY LUBRICANTS

help maintain a continuous supply of rock for urgent ordnance plant project



500,000 cubic yards of rock will be furnished from this quarry for a large ordnance plant in Ohio. Efficient equipment performance and extra hours of trouble-free service with Gulf lubricants are playing a large part in keeping the contractor ahead of schedule.

Equipment performs efficiently, with no delays from mechanical troubles, as Gulf Engineering recommendations are carried out right from the start of the job.

"WORKING against time to excavate and move 500,000 cubic yards of rock, we can't take chances with our lubrication," says contractor on ordnance plant project. "With Gulf lubricants we're getting the efficient, trouble-free equipment performance necessary to complete the job well ahead of schedule."

Proper lubrication—always a necessity for the satisfactory operation of quarry and cement plant equipment—today is a vital requirement for maximum production. For delivery dates on repair parts and new equipment are increasingly uncertain. Breakdowns of key equipment can well be a serious matter.

So play safe—call in a Gulf service engineer and ask him to recommend the proper application of lubricants exactly suited for each unit of your equipment. His knowledge and experience can profitably be applied to your problems.

The services of a Gulf engineer—and the Gulf line of more than 400 quality oils and greases—are available to you through 1200 warehouses located in 30 states from Maine to New Mexico. Write or 'phone your nearest Gulf office today.

GULF OIL CORP. · GULF REFINING CO.

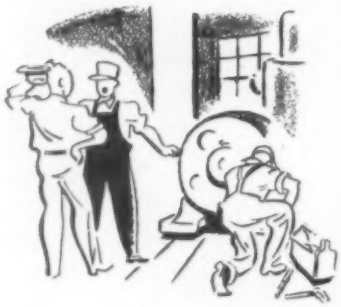
Gulf Building, Pittsburgh, Pa.

GULF INDUSTRIAL LUBRICATION

What's Your No

Here are 6 of the Most Important

1 UNEXPECTED BREAKDOWNS?



How many of your key machines were designed for 24-hour-day service?

2 LOW-GRADE DEPOSITS?

Has increased wartime demand brought new processing problems?

3 LABOR SHORTAGE?

Does part of your process use men unnecessarily? Crushing is a *machine* industry

In modern laboratories trained engineers analyze materials on machines like this X-ray spectrograph — there's no guesswork when you come to Allis-Chalmers.

WHICHEVER IT IS —

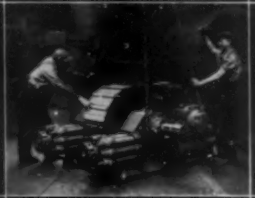
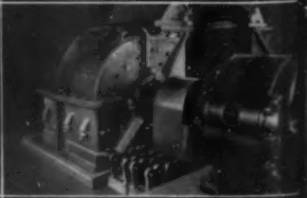
CALL ON

HERE'S SOMETHING for every crushing man to lean on these days — and lean on *hard* . . . Allis-Chalmers Cooperative Engineering. There's nothing else like it! Here's why . . .

Because it's hard to get new machinery these days, often old equipment must be made to do the job. And that's where Allis-Chalmers' vast experience and "know-how" can help you. Making all types, complete lines of equipment, our engineers analyze your problem from the viewpoint of your entire production process.

That means that Allis-Chalmers engineers are

Only Allis-Chalmers Makes a Complete Line of this Equipment!

Jaw Crushers	Gyratory Crushers	Crushing Rolls	Pulverators
			
All-steel primary and fine reduction. ¼"-12" product.	High-speed primary and secondary. 3" to 60" size feed.	6 different types. Reduction ratios from 5-1 to 10-1.	"Multi-impact" reduces non-abrasives to cubical shape.

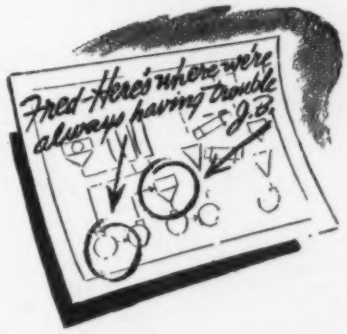
. 1 Headache? . .

Problems facing Processors today —

4 LAGGING SCHEDULES?

Maybe you have a bottleneck machine—an added machine would load up other units.

5 OBSOLETE MACHINERY?



Much equipment that "got by" in peacetime needs too much maintenance today.

6 OVERWORKED ENGINEERS?

Outside engineering cooperation may be all that's needed to get you out of a hole.

ALLIS-CHALMERS!

"complete line" engineers . . . familiar with every step in the basic processes. They know how vital it is for various machines to team-up properly — and know how to *achieve* that team-work!

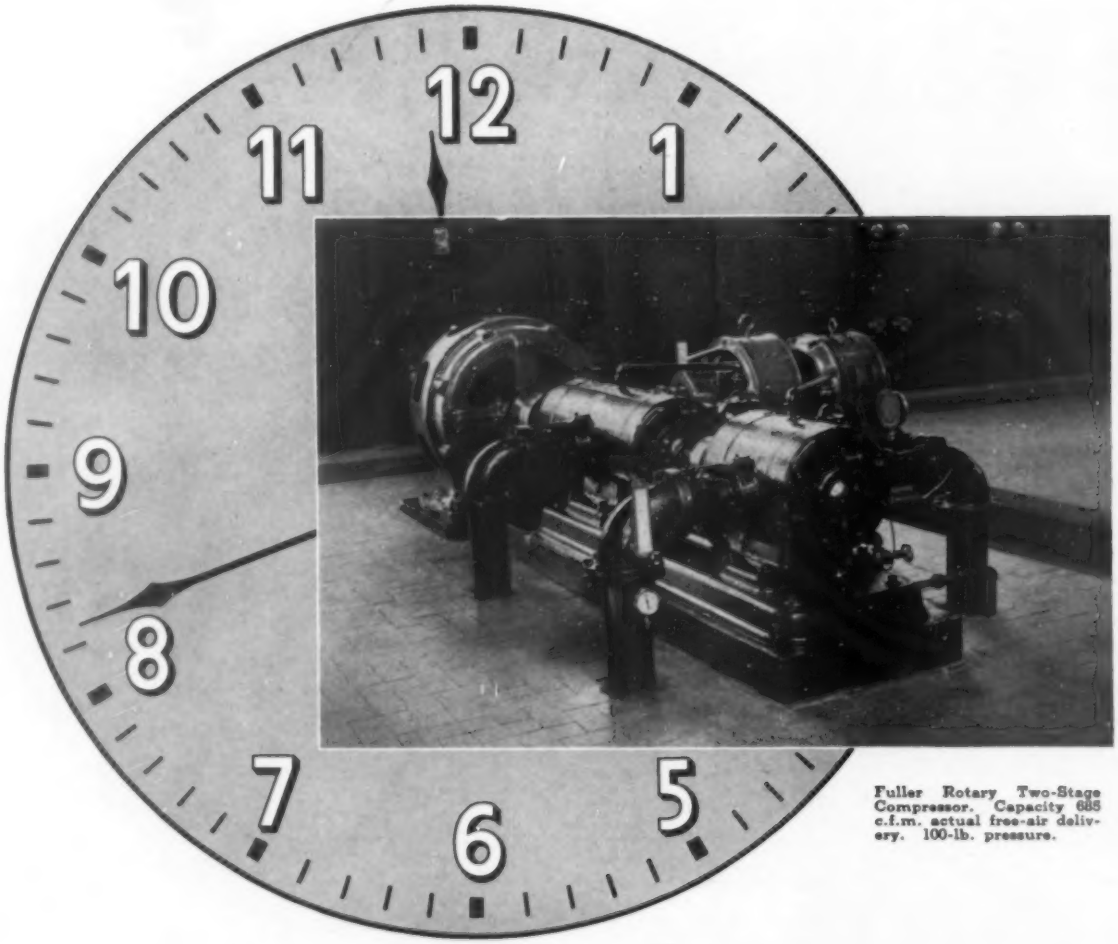
And they don't have to push any one type of equipment . . . because Allis-Chalmers builds *all* types — *eight* types of screen, for example, not just one or two types!

Result: Allis-Chalmers engineers have the same point of view as *your* engineers. Their objective is to give you precisely *the* right equipment for your particular needs!

Whether you have a big or a small problem, Allis-Chalmers Cooperative Engineering is yours for the asking — with no strings attached. Write, wire or 'phone your nearby Allis-Chalmers district office. Or write ALLIS-CHALMERS MFG. CO., MILWAUKEE, WIS.

A 1561-B

Grinding Mills	Pyro-Processing	Vibrating Screens	Motors & Drives	Centrifugal Pumps
30 types — over 3600 in service on every material.	Kilns, coolers, dryers, roasters engineered in all types.	Efficient separation and dewatering — 8 different types.	Unbeatable team—Lo-Maintenance Motor & Texrope V-belts.	Largest line, highest efficiencies — built with motors.



Fuller Rotary Two-Stage Compressor. Capacity 685 c.f.m. actual free-air delivery. 100-lb. pressure.

'Round the Clock Performance... Fuller Rotaries Give it to You

FULLER ROTARY COMPRESSORS AND VACUUM PUMPS
BUILT FOR CAPACITIES TO 1800 C. F. M. PRESSURES TO 125-LB. VACUUMS TO 29.90-IN. REFERRED TO 30-IN. BAROMETER

'Round the clock, 24 hours, day in and day out service with comparatively little shut-down or maintenance expense. That's why plant superintendents and maintenance men like Fuller Rotaries.

Performance records show they're truly the economical unit to install . . in a foundry $3.90 for repairs in three years; in a patent fastener plant, four years' operation: "It has run 23 hours per day almost continuously and has given no trouble." Not a cent was spent for repairs during these four years.

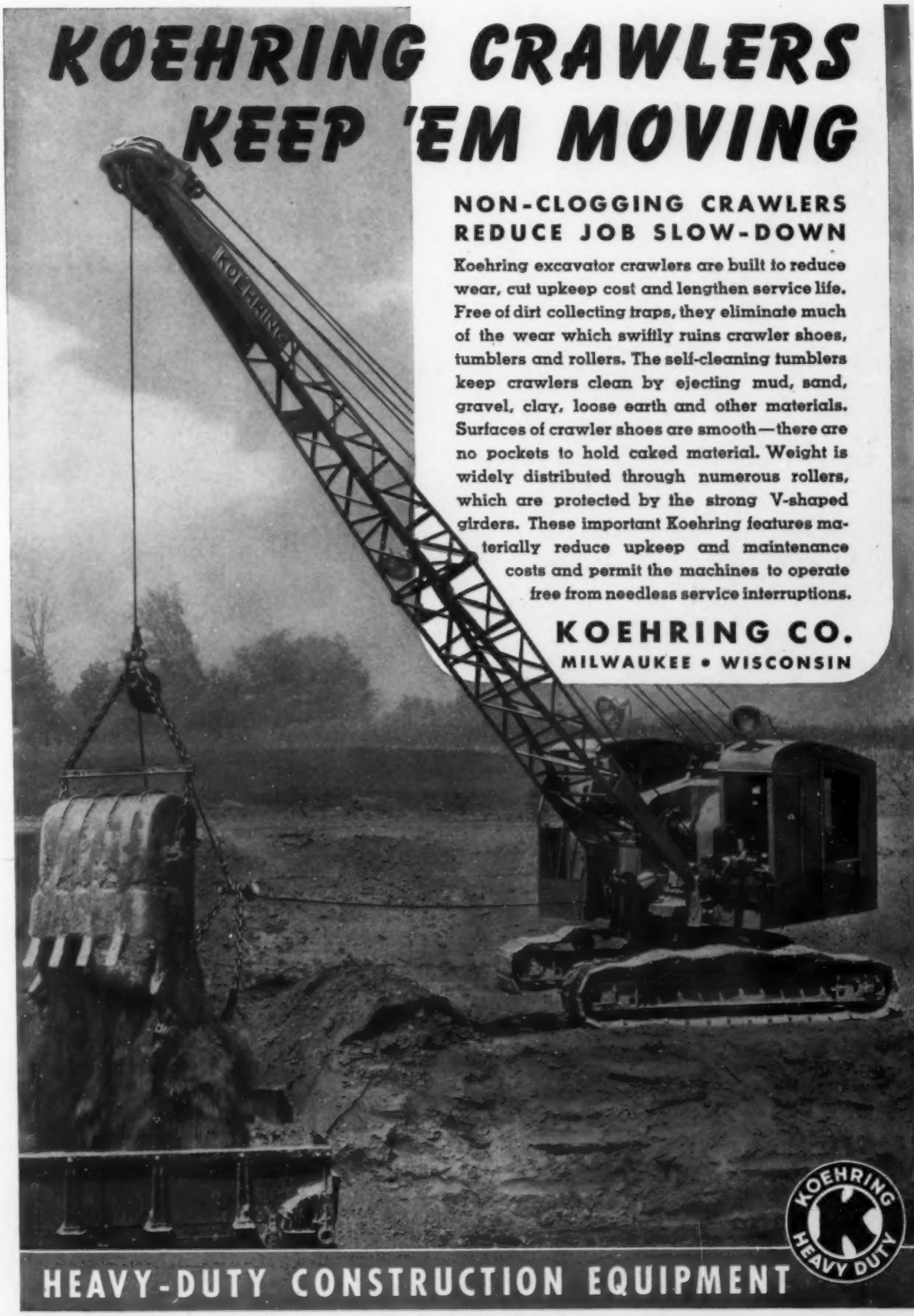
Repeat orders also tell a conclusive story. A steel company purchased its first Fuller in 1939 and to date has installed 14 machines. An oil company has purchased 31, a cement company 28, machinery manufacturer 27, soap manufacturer 17.

Get acquainted with Fullers. Write for new Bulletin C-5 . . . it's yours for the asking.

C-76

FULLER COMPANY
CATASAUQUA — PENNSYLVANIA
CHICAGO—Marquette Bldg. SAN FRANCISCO—Chancery Bldg.

KOEHRING CRAWLERS KEEP 'EM MOVING



NON-CLOGGING CRAWLERS REDUCE JOB SLOW-DOWN

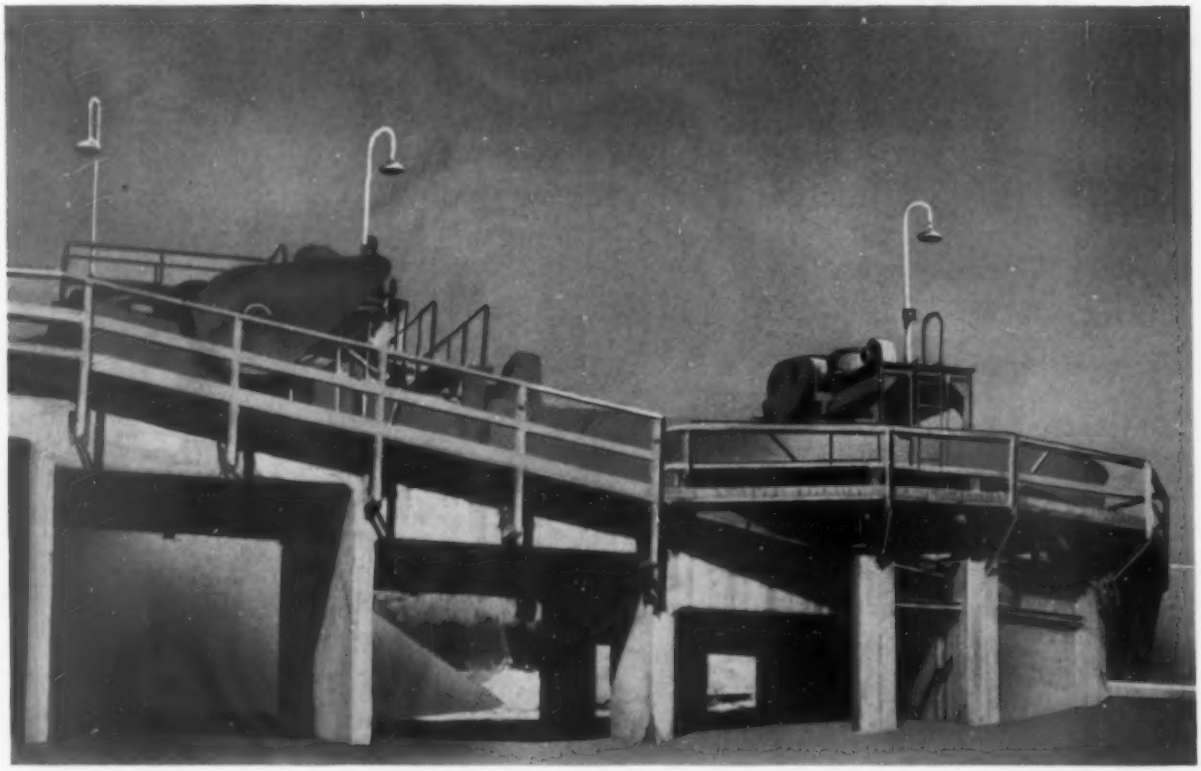
Koehring excavator crawlers are built to reduce wear, cut upkeep cost and lengthen service life. Free of dirt collecting traps, they eliminate much of the wear which swiftly ruins crawler shoes, tumblers and rollers. The self-cleaning tumblers keep crawlers clean by ejecting mud, sand, gravel, clay, loose earth and other materials. Surfaces of crawler shoes are smooth—there are no pockets to hold caked material. Weight is widely distributed through numerous rollers, which are protected by the strong V-shaped girders. These important Koehring features materially reduce upkeep and maintenance costs and permit the machines to operate free from needless service interruptions.

KOEHRING CO.
MILWAUKEE • WISCONSIN

KOEHRING K HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

DORR C. C. G. RESULTS



AT CALAVERAS CEMENT CO.

RESULTS
at Calaveras Cement Co.

CAPACITY INCREASES
Raw Grinding—61%
Rotary Kilns—13%

POWER DECREASES
Raw Grinding—36%

FINER RAW GRINDING
94% —200 mesh; formerly 88%
0.5% —100 mesh; formerly 3-4%

BETTER CEMENT
Better quality due to elimination of stray oversize and finer grinding.
More Uniform slurry as to particle size, moisture and composition.
Improved burning conditions.

THE BOX at the left contains the actual production results of Dorr C.C.G. (closed circuit grinding) at the Calaveras Cement Company's plant at San Andreas, California. Check them carefully, for they show advantages far beyond normal expectancy.

The increased raw grinding capacity was secured without the addition of more grinding mills. The finer raw grind means a sounder finished cement, low in free CaO, as well as an increased capacity of kilns and finishing mills. This increased capacity, plus reductions in power and other costs, will in all probability repay the cost of the change-over in less than a year.

These results illustrate the possibilities of a conversion to partial Dorr C.C.G. Existing plants with raw compartment mills or individual ball mills can be changed over to partial Dorr C.C.G. without interruption of operation. Calaveras is such a conversion—and the results speak for themselves.

We would like to show you further facts and figures on such an installation.

DORRCO

THE DORR COMPANY, INC., ENGINEERS
NEW YORK, N. Y. . . . 570 LEXINGTON AVE.
ATLANTA, GA. . . . CANDLER BUILDING
TORONTO, ONT. . . . 80 RICHMOND ST. W.
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DENVER, COLO. . . . . COOPER BUILDING
LOS ANGELES, CAL. . . . 811 WEST 7TH ST.
RESEARCH AND TESTING LABORATORIES
WESTPORT, CONN.
SUGAR PROCESSING
PETREE & DORR ENGINEERS, INC.
570 LEXINGTON AVE., NEW YORK

DORR
RESEARCH · ENGINEERING · EQUIPMENT

ADDRESS ALL INQUIRIES TO OUR NEAREST OFFICE

Snake Holes!

WHETHER you call them, in your part of the country, "snake holes", or "toe holes", or simply "flat holes"— it's all the same to a Cleveland DR30 wagon drill. These low, slightly angling holes are just one kind that the Cleveland handles extremely well. It drills in any position, at any angle — straight down, flat, breast high, or higher than your head, or within four inches of the ground level — even straight up, when such a hole is needed. You will like the way it cleans the hole, and the drill runner will be enthusiastic with its ease of moving from one position to another. The DR30 has a feed capacity of more than eight feet. It handles depths to twenty-five feet, and more. You will want to see the recoil device, the handy centralizer, the double-screw, geared-together mechanism for raising the U-bar. Demonstration will be arranged to suit your convenience. May we send new Bulletin 132?

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CANADIAN DISTRIBUTORS

Purves E. Ritchie & Son, Ltd., 658 Hornby St., Vancouver, B. C.
Whitehall Machine & Tools, Ltd., Galt, Ontario

★ Due to the necessity for conserving rubber, we can supply pneumatic tires only on special order for Government projects. You will find the broad-rimmed steel wheels a satisfactory substitute. There is a suitable price adjustment on account of omitting the rubber tires.

★ ★

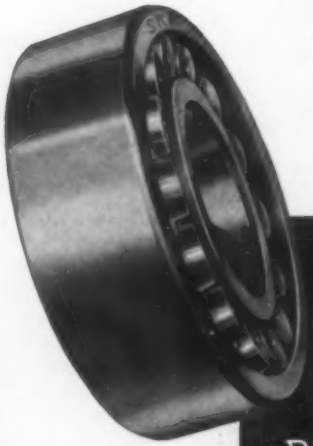
THE CLEVELAND ROCK DRILL CO. CLEVELAND, OHIO

Back of the ELLIPTICAL motion on ELIPTEX Screens

● *Built by*
ROBINS CONVEYING BELT CO

If you want to know what causes the uniform elliptical motion that propels material forward while turning it over and over again on this Robins Eliptex Screen, look at the vibrator. Here two shafts carrying unbalanced weights create a compound centrifugal force by turning in opposite directions at high speeds. Naturally, they're mounted on SKF Spherical Roller Bearings which are built to withstand both static and gyrating loads encountered in this type of application. SKF's are always on hand where inherent rolling alignment, equalized load distribution and freedom from care are essential. 5157

SKF INDUSTRIES, INC., FRONT ST. & ERIE AVE., PHILA.



SKF

BALL AND ROLLER BEARINGS

★ ★ ★ ROCK PRODUCTS ★ ★ ★

MUST POINTERS FOR EVERY OPERATOR

NEWS FLASHES

COMMENTS BRIEFS & INDUSTRY HIGHLIGHTS

NOT NECESSARILY MORE WAR MATERIAL

Washington, D.C.: Every month the administration boasts of larger expenditures for Lease, Lend and War. But it is not added that the Government is paying higher and higher prices. It is not told how much of the extra expenditure is for price increases and how much for larger production. With all its statisticians and economists, it is doubtful if the administration itself knows.

CONVERSION OF PLANT TO WAR WORK

New York City: A prominent Long Island sand and gravel producer isn't producing sand and gravel any more. Already the market there is rapidly falling off. But he is making a living and keeping a part, at least, of his organization together. He has a well equipped machine shop, as many other rock products operators also have. He is using it to make airplane parts. This is particularly interesting to the editors of ROCK PRODUCTS, because we suggested such use of repair shops on this page about a year ago. One thing the producer must remember, no one is likely to come to you with a proposition to make parts in your shop. The initiative is yours. You must find out for yourself who the prime contractors (manufacturers) for war stuff are in your locality. You must find out what parts you can help them make. If they are reluctant to subcontract, get in touch with the local procurement officers of the Government. There is a special bureau within the W.P.B. designed to help you get such business as your facilities are good for. If you don't get some of this business you may eventually have to surrender some of your machine tools.

SEVERANCE PAY.

Philadelphia, Penn.: More than 500 workers of the Edison Cement Corp. were granted close to $500,000 in severance pay, when the plant was closed and its equipment sold to the Chilean Trading Corp. The move was made voluntarily by the company and included a lump sum payment due the workers under a contributory retirement income plan, which had been in operation for several years. The cash benefits were staggered over two-weeks' periods to cushion the blow, until the workers were able to find other employment, which under present conditions they readily were able to do. Some workers received as much as $3500. We haven't seen any mention of this generous act by Governor Edison in the public press, but "Voice of the Union Cement, Lime, Gypsum and Allied Worker" rightly devotes considerable space to it and eulogizes Governor Edison. Such evidence of sincere regard and feeling of responsibility for their employes is evidence that all employers are not as hard-hearted as the New Dealers often picture them.

PREPONDERANCE OF GOVERNMENT CONSTRUCTION

Washington, D.C.: Construction for the federal government will account for 81 percent of all construction in progress by the end of 1942, against 71 percent for the first half of the year, according to the American Institute of Steel Construction. For 1943 "Engineering News-Record" estimates that of about $8,000,000,000 projected construction, all but $585,000,000 will be government stuff. The 8,000,-

000,000 in 1943 compares with nearly $13,000,000,000 in 1942 and $11,500,000,000 in 1941. It is about the same level as the volume of construction in 1940.

POST-WAR CONSTRUCTION BOOM

Chicago, Ill.: Prospects for employment in the construction industry will be "exceptionally good" after the war because of the industry's high degree of mobility, freedom from need of re-tooling and opportunity for employment of many untrained or semi-skilled workmen, Dan W. Kimball, president, Associated General Contractors of America, said here. In a radio interview with Leverett S. Lyon, chief executive officer of the Chicago Association of Commerce, Mr. Kimball said that he foresaw the following post-war building needs:

1. A million new homes a year for many years after the war.
2. Rebuilding of poorly planned cities and run-down urban areas.
3. Expansion of the entire transportation system.
4. Large scale Government public works projects.
5. New building for industries born of war-time technological advancements.

Mr. Kimball predicted that the greatest market for post-war housing will lie in the moderate-cost urban home, built to sell at $2500 to $3500. On the basis of a $110 billion national income, homebuilding will represent 7 percent of the country's total economic activity, he said.

JOYS OF NEWS REPORTING

New York City: There may be no priorities in passenger transportation yet, but the poor guy who has to travel on business no longer derives even a crumb of comfort. A traveling ROCK PRODUCTS' editor reports his trip between two Eastern cities. He caught a train at 9:30 p.m., and "with the help of a can opener" got himself standing room in the vestibule of a car - and he rode there on his feet to 2:30 a.m., when he arrived at his destination. So, gathering news for our readers requires a good soldier, too.

MUST MAKE VOLUNTARY SYSTEM WORK

Chicago, Ill.: Unless business and industry give whole-hearted cooperation to the voluntary transfer of workers to essential war industries, "compulsory measures will inevitably follow," A. A. Liveright, assistant to the director of operations, War Man Power Commission, said here recently. He spoke before the closing session of the American Management Association conference on war-time office practice. "The War Man Power Commission feels that a large part of the job can be done on a voluntary basis," Mr. Liveright said. "Whether it will remain so depends upon business and management. We want to keep it on a voluntary basis as much as possible."

THE SCRAP PROBLEM AGAIN

New York City: At a recent gathering of a group of producers from various parts of the U. S., one well-known man told about an enthusiastic scrap collection warden - or whatever you call 'em - who spotted his plant and urged what a large contribution could be made to the city scrap collection. Said the producer: "If you were to take that my plant would be down in two days. That's my inventory of repair parts; my only hope of continuing production for war jobs." Something ought to be done to pin a medal on an operator with intestinal stamina to refuse scrap in spite of aspersions regarding his patriotism, because he wants to supply Uncle Sam with something more important at the moment than scrap steel.

The Staff

OUR FLAGS

Old Glory—symbol of our democracy—of the freedom it guarantees—of the goal it struggles toward—of ideals it embodies—of sacrifices, by others, for us. ★ ★ Our Service Flag—our fellow workers, on the battle front. ★ ★ The Minute Man—our share in financial support of their effort. ★ ★ The Army-Navy "E"—awarded the employees of Barber-Greene for efficiency in production. ★ ★ We are proud that machines developed by us for the enrichment of our peacetime way of life, may now serve so effectively in our country's defense. ★ ★ We of Barber-Greene pledge our continued effort to "keep them flying."

BARBER-GREENE COMPANY
AURORA, ILLINOIS, U. S. A.

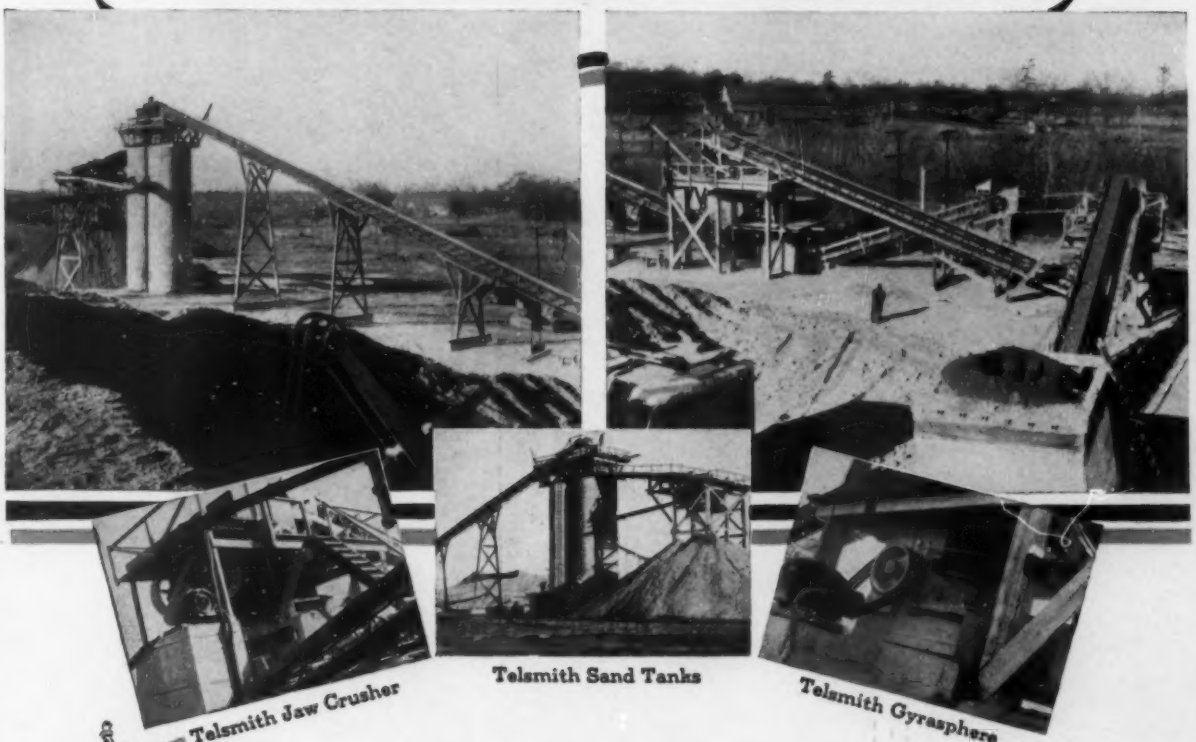
Buy United States War Bonds-Stamps

Barber-Greene Bituminous Central Plant
Similar to equipment now being built by Barber-Greene Company for U. S. Army, Corps of Engineers
PRINTED IN UNITED STATES OF AMERICA

TELSMITH Gravel Plant

goes all out

FOR WIN-THE-WAR CONSTRUCTION



Telsmith Jaw Crusher

Telsmith Sand Tanks

Telsmith Gyrasphere

★ Minus and plus ¾" and minus 1½" gravel, and sand is in demand for war projects in the vicinity of Pawtucket, R. I. Starting operation Nov. 1, 1941, this new Telsmith equipped gravel plant of J. J. McHale & Sons near Pawtucket is turning it out at about 125 to 150 tons per hr.

A 1¼ cu. yd. shovel and two end dump trucks feed raw bank run gravel into an 8 cu. yd. hopper having a railroad rail grizzly that rejects the few oversize boulders. A 30" x 5'6" Telsmith Reciprocating Plate Feeder feeds material out of hopper and over a No. 450 Telsmith Rotary Grizzly with 3¼" spaces. Plus 3¼" goes to an 18 x 30 Telsmith Roller Bearing Jaw Crusher. A 30" x 73' belt conveyor takes minus 3¼" direct from the grizzly, and from the jaw crusher, to a 4' x 10' Telsmith Single Deck Pulsator. Plus 1½" from this scalping screen goes into a No. 36 Telsmith Gyrasphere Crusher; and when crushed returns to the 30" primary conveyor via an 18"x48'6" conveyor.

Minus 1½" from the scalping screen goes via a 24" x 186'6" finished product conveyor to a 5' x 12' Telsmith 2-Deck Pulsator for washing and sizing. Sand is flumed to two No. 8 Telsmith Sand Tanks on a tower independent of main plant. The two sizes of gravel are deposited in two 20' diam. concrete-block silo bins, fitted with bin gates for loading into trucks.

Why do so many operators with war construction jobs depend on Telsmith? Because Telsmith equipment can be pushed to *top speed* and *will produce*. Telsmith Engineers' plant planning is sound. Telsmith Service is fast. *Get Bulletin G-11.* G-10

SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE, WISCONSIN

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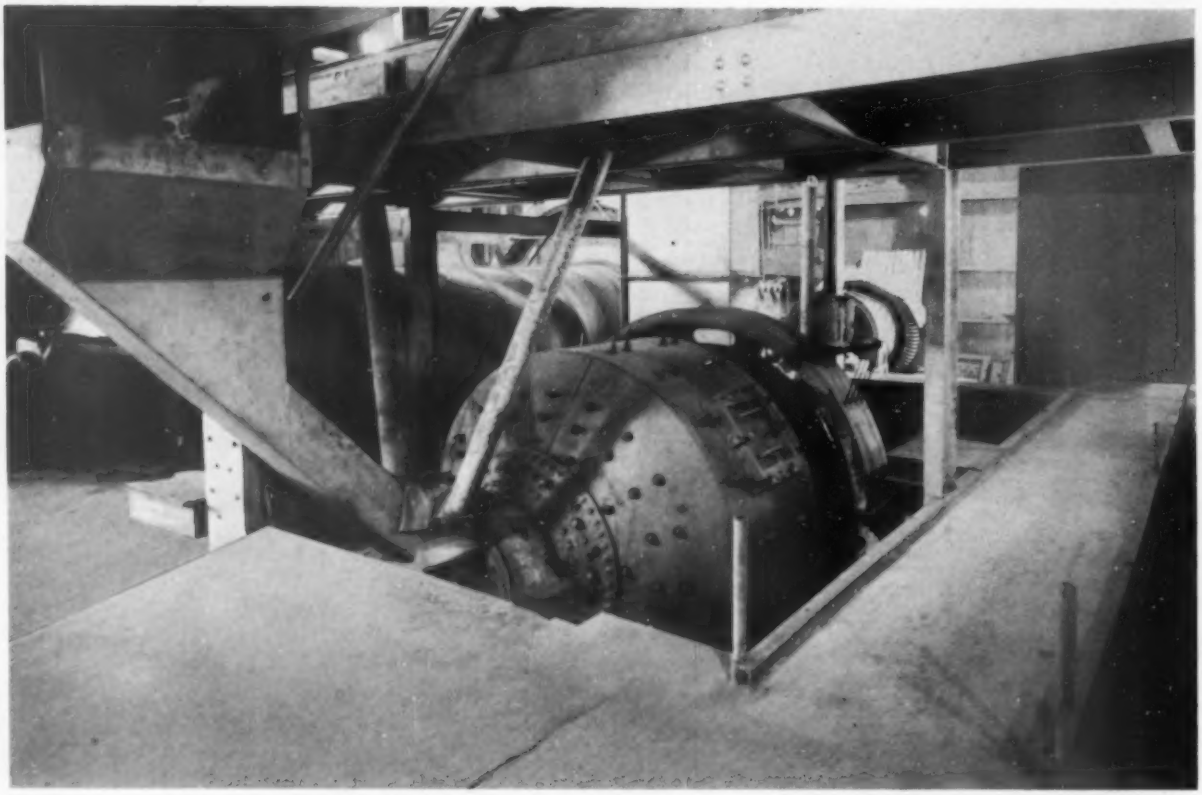


Conical Mill Replaces Tube Mill At Medusa Cement

Excerpt of an article in ROCK PRODUCTS Magazine, Sept., 1942, page 34:

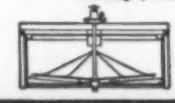
> "In rebuilding the entire clinker grinding mill, just completed, two-stage operation with (Hardinge conical) ball mills in circuit with vibrating screens, followed by closed-circuit operation of tube mills was adopted. Lower power costs were sought, in particular, by this conversion."

A preliminary grinding tube mill was actually replaced by the Hardinge Mills. Both types of mills use balls as the grinding media, but it is the shape of the Conical Mill that puts those same balls to work so much more efficiently that actual replacement by the Conical Mill was warranted and is proving to be a most profitable venture.

HARDINGE

COMPANY, INCORPORATED – YORK, PENNSYLVANIA

122 East 42nd Street, New York, N. Y. | 205 West Wacker Drive, Chicago, Illinois | 501 Howard Street, San Francisco, California | 200 Bay St., Toronto, Ontario, Canada



CONICAL MILLS | COUNTER CURRENT CLASSIFIERS | THICKENERS CLARIFIERS | RUGGLES-COLES DRYERS | CONSTANT WEIGHT FEEDERS | TUBE ROD AND BATCH MILLS

Make This Simple Test

It Will Show You A REAL SAVING *in Belt Costs!*

As a V-belt bends, you can actually feel its sides change shape! The top of the belt is under tension and grows narrower (see Figure 1, at right). The bottom is under pressure—therefore it widens. These stresses force a straight-sided V-belt to bulge in the sheave groove (Fig. 1), and this produces uneven wear on the belt sides, resulting in shorter life!

Now look at Figure 2. There you see how the concave side of the Gates Vulco Rope exactly corrects this bulging. It insures a perfect fit in the sheave groove with uniform side-wall wear and, therefore, longer life! It insures that the entire side-wall grips the pulley—heavier loads are carried without slippage—belts are saved and power consumption reduced.

Only belts built by Gates are built with the Concave side, which is a Gates patent.

What Happens When a V-Belt Bends

FIG. 1

FIG. 2

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

Chicago, Ill. 549 West Washington
New York City 215-219 Fourth Avenue
Birmingham, Ala. 405 Liberty National Life Bldg.
Los Angeles, Cal. 2240 East Washington Blvd.
Denver, Colo. 999 South Broadway
Dallas, Tex. 2213 Griffin Street
Portland, Ore. 333 N. W. 5th Avenue
San Francisco, Cal. 2700 16th Street

PRIZE OFFER FOR Maintenance HINTS and HELPS For Publication in ROCK PRODUCTS

WAR

Requires **INGENUITY**
Requires **RESOURCEFULNESS**
Requires **CONSERVATION**

In the Use of Men Material and Equipment

PRIZES

One $100 War Savings Bond —First Prize
Two $50 War Savings Bonds—Two Next Best
Two $25 War Savings Bonds—Two Next Best
Five $10 In War Savings Stamps—Five Next Best

Space rates with a minimum of $5 each will be paid for all other Usable Hints and Helps accepted by the Editors.

RULES

1. Any reader of ROCK PRODUCTS actually engaged in a rock products operation may offer a contribution.
2. The manuscript may be type-written or written long-hand, pencil or ink; spelling or grammar makes no difference—it is the usefulness or applicability of the idea or device as described that counts.
3. The manuscript should be accompanied by an illustration if possible. This may be a snapshot photo, pencil sketch, blueprint, etc.
4. The subject selected to be described may be any part of the operation—any phase of the production process. It may be on maintenance or repair of a piece of equipment or machinery; it may be a money-saving or maintenance idea on lubrication; an accident-prevention idea; a cost-keeping idea; a way of meeting labor or public relations problem—any subject made live by war conditions, or brought about largely by Ingenuity, Resourcefulness and Conservation as a result of war necessities.
5. In case of a tie for any of the prizes, duplicate prizes will be awarded to the persons tying.

JUDGES

The judges will be two prominent producers and the Editor-in-Chief of ROCK PRODUCTS.

Address all contributions and communications to

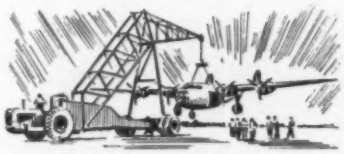
War Ingenuity Contest
ROCK PRODUCTS
309 West Jackson Blvd.
Chicago, Ill.

The contest is now open and closes on December 15, 1942. Prize winning HINTS and HELPS will be published in the January 1943 issue and following issues.

Act Now!

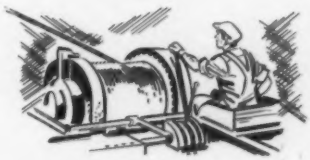
"Hey, Joe! Spool that new line right the FIRST time..."

"YOUR UNCLE SAM'S AIR CORPS uses a lot of wire rope, Joe. Uses it right, too, because wire rope's got a lot of important jobs in this man's flying army: swinging half-ton eggs into bomb racks and towing planes out of hangars —big ropes for the cranes that "walk away" with damaged craft and fine cables for control in the air . . ."



Let's look at it this way: wire ropes, like people, pick up habits quick and easy, lose 'em hard. A wire rope's habits, in the Air Corps or any other place, begin when it's first spooled off the reel—and *bad* habits in a wire rope mean shorter rope life, sloppy service. When you spool a new line onto the drum, observe the following rules:

Wind the rope with *special care* the first time you do it. A little extra time spent on the first wind will pay big dividends. *Guide the first layer carefully into place.* With a smooth-faced drum, this means to make each turn fit snug against its neighbor *without* interlocking of strands. For best results, the dead wraps must be wound tight against the drum face.



Be sure there's a brake on the reel. This provides uniform winding tension which produces necessary snugness and prevents rope damage due to over travel of reel. Mount the reel on substantial cribbing some distance from the drum so that rope pulls off the underside. If the reel must be placed close and the rope wound to top side of drum, the rope should pull off top of reel, but here special care is needed in braking the reel to avoid upsetting. Be sure the rope lead from reel to drum is straight and unobstructed.

By following these simple rules in spooling new line, you'll be helping

that line to work better and longer. With Roebling "Blue Center" Steel Wire Rope, that means getting all the *extra* value built in by Roebling's 100 years of wire-rope engineering, means keeping that wire rope on the job for Victory.

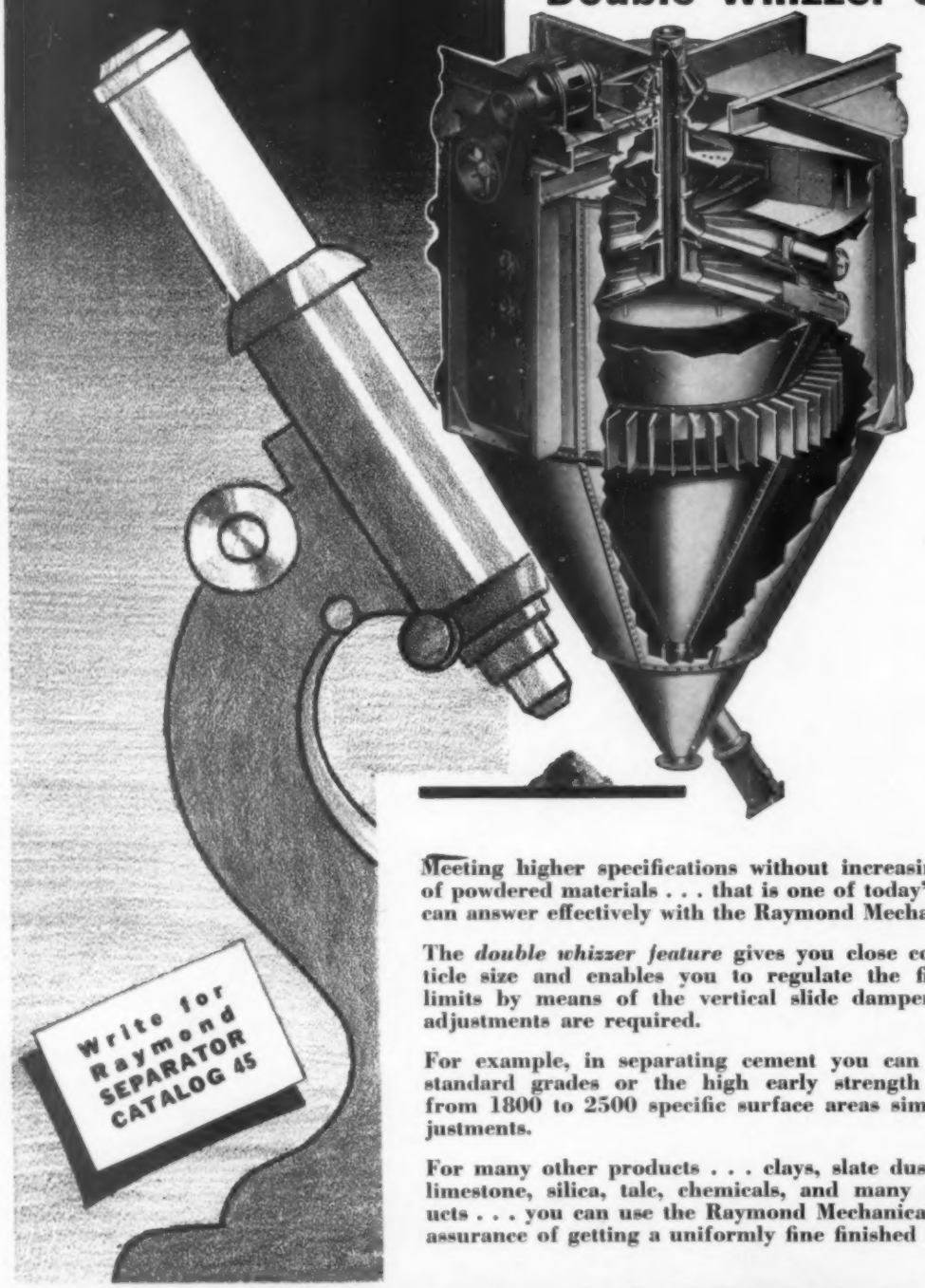
JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY
Branches and Warehouses in Principal Cities

★ PROMPT SERVICE
★ on essential orders
from warehouse
★ stocks or mill

ROEBLING
"Blue Center"
STEEL WIRE ROPE
PREFORMED OR NON-PREFORMED

PRECISION SEPARATION

with The RAYMOND Double Whizzer Separator



Meeting higher specifications without increasing production costs of powdered materials . . . that is one of today's problems that you can answer effectively with the Raymond Mechanical Air Separator.

The *double whizzer feature* gives you close control over the particle size and enables you to regulate the fineness within wide limits by means of the vertical slide dampers . . . no interior adjustments are required.

For example, in separating cement you can produce either the standard grades or the high early strength cements, anywhere from 1800 to 2500 specific surface areas simply by the slide adjustments.

For many other products . . . clays, slate dust, gypsum, graphite, limestone, silica, talc, chemicals, and many manufactured products . . . you can use the Raymond Mechanical Air Separator with assurance of getting a uniformly fine finished material.

RAYMOND PULVERIZER DIVISION
COMBUSTION ENGINEERING COMPANY, INC.
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SINCE 1881

WHATA YA MEAN "FREE ENTERPRISE?"

YES, it's natural that a reader of the editorial in our October issue, expressing confidence in the survival of free enterprise in America should ask: "Whata ya mean, free enterprise?" Happenings before and since then are enough to make many skeptical of how much free enterprise is left in this country. Also, it is evident that "free enterprise" means different things to different people. That's unfortunate.

Free enterprise to us means, first of all, the right of a man to work or not. Of course, that is relative, for if a man has not the means to live without working, necessity or pride will make him work, or live on charity. If he is capable of working and unwilling, in a Christian country, he and his children will not starve, but we think undisguised charity is better than a Government dole, which in the course of time he comes to consider his rightful due.

Free enterprise means that a man has a free choice to work for whom, at what kind of a job he pleases, at the highest wages he can obtain. In a well-organized society he has the benefit of as good an education as he is capable of absorbing and the benefit of vocational guidance; but he is not "frozen" to any kind of a job by bureaucrats in Government.

Free enterprise, it follows naturally from the foregoing, means that a man has the right to quit his employer for another if he thinks he is bettering himself by so doing.

Free enterprise means that a man is entitled to keep his savings for himself and to invest them as he sees fit. He has the right to use his savings to go into a business of his own; in competition with his employer if he chooses. If he proves the better man he has the right to his former employer's business.

Free enterprise means that as an employer he has the right to employ whom he chooses to help make a success of his business. This right, of course, is and will remain relative, since society no longer recognizes the right of an employer to be capricious in his hiring and firing.

Free enterprise means that the employer, or owner, is permitted to retain enough profits of his business to give him an incentive to enterprise. Society has limited and will continue to limit profit taking, because some abused this right. Also, we believe that enterprisers in the future will be content to accept less financial return than has been their custom; but that they will find more and more satisfaction in their larger contribution to the common welfare.

Thus, free enterprise is not merely something to be desired and retained by the employer, but is the very kernel of the individual liberties of the worker. We are finding out by experience that we can not have a planned economy without planned use of man-power. Planned use of man-power must ever result in freezing John Jones to his job of ditch digger; Frank Smith to his job of clerk; Oliver Twist to his job of coal miner, etc. Some superpower (a Government bureaucrat actually) is going to tell off each and every one of us and put us in our places. That just goes against the grain of all Americans.

For the big shot executive probably never would have become a big shot if he hadn't had a free opportunity to arrive. He didn't have to depend on being "discovered" by some professorial bureaucrat's psychoanalysis. The professor probably would have rated him a numbskull. However humble the worker he wants to feel that his chance to become a big shot is as good as the chance his boss had. That's the American way of life, and it's intimately concerned with our ideas of individual liberty.

We are not among those who see in the present situation an overpowering desire or intent to saddle us with the kind of planned economy outlined. The American people are willing to make any sacrifice for victory in this total war. They are willing, with some grumbling, even to see free enterprise practically eliminated for the duration, as it seems likely to be. But don't let any New Deal economy planner think for one minute that this is a step toward permanent abolition of our system of free enterprise. Far from it. This war-time taste of planned economy is going to prove so distasteful to the American people, that when the war is over, these over-all planners of society are going to be skidded off their altars so fast, you won't be able to see them in the dust.

No, we haven't any fear of the ultimate outcome of our American way of life. It's a good thing we are giving this planned economy a try at a time when the American people will stand for it as a patriotic sacrifice. We'll be fed up with our experience. We can stand bungling with our private lives and pursuit of happiness in such times; but in times of peace; well, that's something else. One does not appreciate this land of liberty until he has to fight for it; also, he does not appreciate his individual freedom until he has given it up—temporarily.

Nathan C. Rockwood

HINTS AND HELPS

Underside of Belts Cleaned by Sprays

By WALTER B. LENHART

HIGH BELT SPEEDS at the Shasta sand and gravel plant require that the under side of the belts be kept clean. Scrapers of conventional design take off most of the muck but water sprays really finish the job.

Sprays on underside of belt remove muck

Where the conveyor is in the field pit and moved from time to time no effort is made to control the waste water and muck but in the plant or wherever it appears desirable, hopper-like aprons are welded under the assembly and the waste water disposed of without messing up the ground below. This appears to be an excellent solution of a very vexing problem.

Reducing Fines in Sand

IN THE OPERATION of a Dorr type classifier for processing of sand, it is often desirable to reduce the amount of fine sand that is brought up over the sand discharge lip. This can be done in several ways: (1) increase the strokes per minute of the rakes as that creates more agitation and does not allow the finer materials to settle; (2) the size of the settling pond can be reduced by lowering the overflow lip, or by increasing the steepness of the installation; and (3) install water sprays so that the water impinges on the sand after it leaves the upper edge of the settling area within the classifier.

The location of this spray is important for it can wash the sand back into the classifier and cause the machine to stall. In the illustration shown the sprays are at the extreme upper portion of machine, just above where the sand falls to the hopper below.

Incidentally at the operation illustrated some gold is recovered from the sand. Any sand and gravel operator wishing to test his deposit can best do so by taking sand from his classifier bed at that point where the rakes emerge from the water. For at that point the washing action of the water is greatest, and if there is any gold at all in the deposit, a concentration will be had at that point. Send your sample to some assayer, if you are not familiar with how to "pan" for gold.

Showing use of spray with classifier to reduce fines in sand

How to Test Cylinder Lubrication

By W. F. SCHAPHORST

HERE IS A METHOD for determining whether or not a cylinder is properly lubricated which originated with an engineer. He was getting ready to examine a cylinder preparatory to a test on a new lubricant that he was going to try out. This is the plan which he adopted:

When the head of the cylinder was removed the walls and head of the piston looked well lubricated and were pronounced by the operating engineer to be in "excellent condition." My friend took four pieces of white paper and asked the engineer to rub them horizontally on the top, sides and bottom of the cylinder, reaching as far back as possible. These pieces of paper were then marked "Top," "Bottom," "Right Side" and "Left Side" to correspond correctly with actual conditions. They were also dated.

While this particular cylinder wall or surface seemed to be well lubricated, very little oil appeared on the four pieces of paper, and the oil was of a rusty color. After the new lubricant had been in use for three weeks they repeated the operation, and the difference in the two sets of papers was so great that the engineer unhesitatingly remarked that he then had ten times more oil on the cylinder walls than before, notwithstanding the fact that the feed of the lubricator had been cut down to feed one-third as much oil as previously.

Shortly afterward the engineer had occasion to open another cylinder.

The paper was applied to the top of the cylinder first and the paper showed practically no oil at all. The sides were a little better, and there was too much water in the cylinder to make the test on the bottom. The test was repeated and the papers came out almost entirely free of oil, indicating that the cylinder was not being properly lubricated.

Arc Welder Plug-in Outlets Simplify Maintenance

BEING FAMILIAR with the great economies of arc welding in maintenance work and realizing that cases would arise where maintenance jobs could not be brought to the repair shop, the Peerless Cement Corp., Detroit, Mich., installed outlets at various points throughout the mill so that their portable Lincoln arc welder could be plugged in and perform the necessary welding right on the job. This is particularly advantageous in cases of break-down of heavy parts which would require considerable time and labor in dismantling them so that they could be taken to the repair shop, or where structural welding is required in alterations, or other applications. The number and location of outlets for the portable welder are arranged to take care of the entire plant.

Two typical examples of moving the repair shop to the job in maintenance work are duct work connecting a dust washer and tower, (see

Fig. 1), and repair of a kiln tire, (see Fig. 2). The duct work in Fig. 1 was built of ¼-in. plate with angle iron stiffeners. In the case of the kiln tire, the crack, (see weld between 2nd and 3rd openings from bottom in Fig. 8, was veed out, a rib reinforcing plate was installed and welded between the two side walls of the tire.

Smaller maintenance jobs are taken directly to the repair shop. Examples include: the crane wheel, (see Fig. 2), which was built up by application of weld metal followed by grinding to desired dimension; the center pin shaft, (see Fig. 4), for a 3 cu. yd. clam shell bucket which was built up to original dimensions and ground to size; a cone for a coal pulverizer, (see Fig. 5), was built up by arc welding in case of wear; a ventilating fan duct Y, (see Fig. 7), which was fabricated of 3/16-in. mild steel plate with angles; a thrust roll for a kiln, (see Fig. 8), shafts of which are built up by three to six beads of weld metal laid circumferentially; and a drag chain, (see Fig. 3), in which links and dogs are installed by welding.

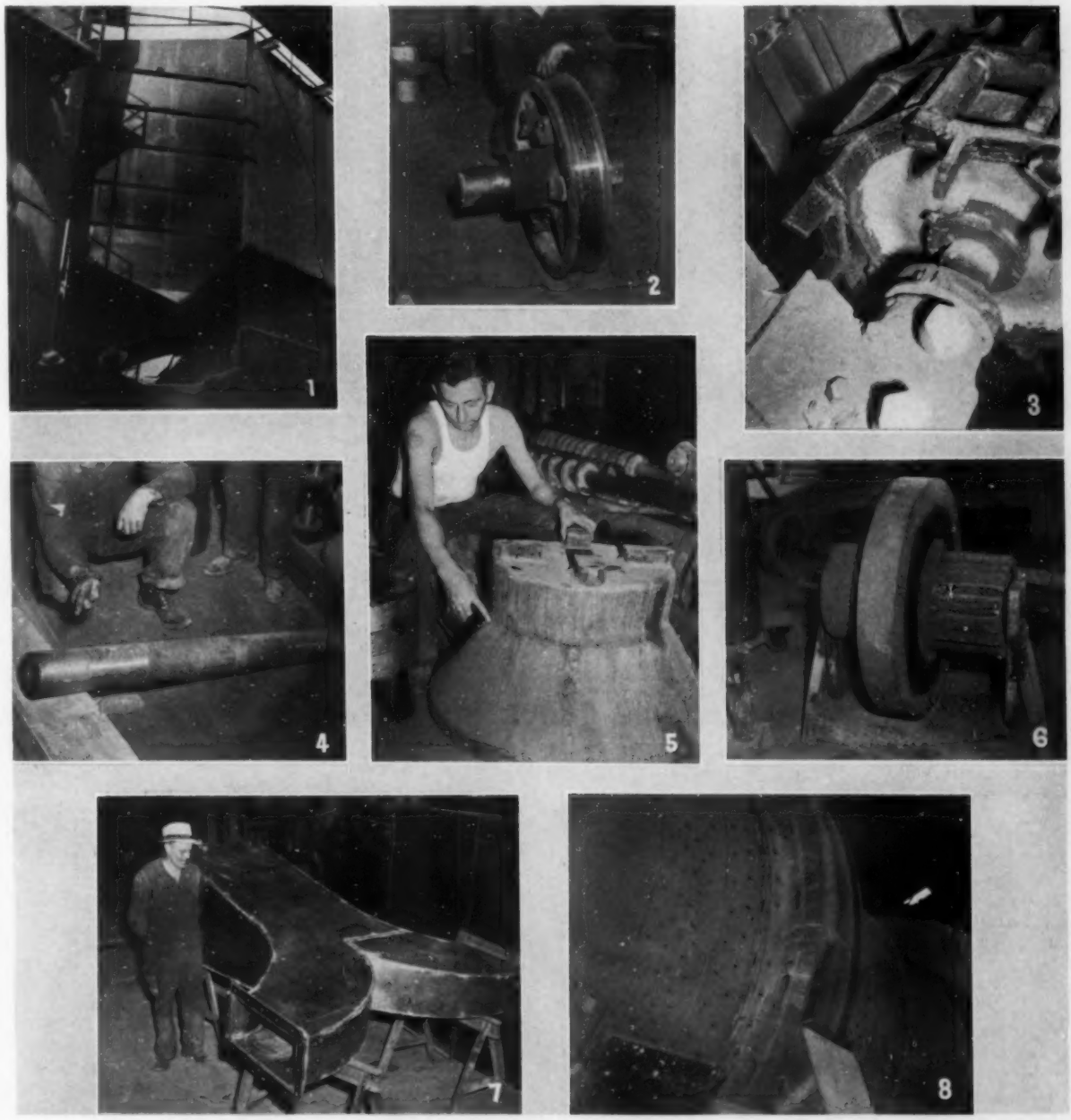

Fig. 1: Arc welded duct work connecting dust washer and tower. Fig. 2: Crane wheel built up by arc welding and ground to required dimension. Fig. 3: Arc welded links and dogs give drag chain greater capacity. Fig. 4: Center pin shaft for clam shell bucket with bearing ends built up by weld metal. Fig. 5: Application of weld metal restored this cone for a coal pulverizer to service. Fig. 6: Thrust roll for kiln with shafts built up by application with weld metal by the electric arc process. Fig. 7: Ventilating fan duct Y fabricated by arc welding of mild steel plate angles. Fig. 8: Tire kiln repaired by rib reinforcing plate arc welded in position

NEWS ABOUT PEOPLE

Deputy Rubber Administrator

COL. BRADLEY DEWEY, one of the world's leading experts on rubber and president of the Dewey and Almy Chemical Co., Cambridge, Mass., has been appointed Deputy Rubber Administrator, Washington, D. C. Col. Dewey is a native of Vermont and a graduate of Harvard University, class of 1908, completing the course in three years. He worked a year as a laborer in Montana copper smelter before entering Massachusetts Institute of Technology, where he received a degree in chemical engineering. After graduation, Col. Bradley went to work for American Sheet and Tin Plate Co., spending the first year as a laborer in various departments to get basic knowledge of steel business. A year later he was selected to organize a research department, which developed rapidly under his guidance, the first steel organization entirely devoted to research. In 1917 Col. Bradley was borrowed by the War Department to pioneer its defense program against poisonous gases. He received the Distinguished Service Medal for his achievements as Chief of Gas Defense Division of Chemical Warfare Service and received the rank of Colonel. After the war, in 1919, he founded the Dewey and Almy Chemical Co., with his war-time associate, Charles Almy, as partner, which has grown under his direction from a single small factory in Cambridge, Mass., to a world-wide organization.

Col. Bradley Dewey

National Gypsum Directors Meet at Lime Plant

MELVIN H. BAKER, president of National Gypsum Co., Buffalo, N. Y., held a directors meeting of his company at Bellefonte, Penn., in September to witness the completion of the $2,000,000 improvement program inaugurated when the property was acquired from the Chemical Lime Co., in December, 1940. This is the fourth of the lime plants acquired by National since 1928. Lime from the Bellefonte and York plants of the company is used as a fluxing agent in steel manufacture. The Bellefonte plant also will furnish lime for the manufacture of synthetic rubber, and another of the four plants will turn over its full production to a government-financed plant for the extraction of magnesium. Attending the meeting at Bellefonte in addition to Mr. Baker were: E. E. Finck, general counsel; G. H. Tarbell and R. F. Burley, vice-presidents; W. M. Currie, president of Currie Products, Ltd., Hamilton, Ont.; J. A. W. Iglehart, partner of W. E. Hutton & Co.; W. L. Jurden, production manager, and Bayard Magee, Bellefonte plant manager.

W.P.B. Mixer Committee

THE W.P.B. has announced the formation of the following new industry advisory committees:

CONCRETE CONSTRUCTION MIXER MANUFACTURERS: B. F. Devine, manager, Construction Machinery Division, Chain Belt Co., Milwaukee, Wis.; L. S. Holden, president, Construction Machinery Co., Waterloo, Iowa; M. V. Gilson, secretary-treasurer, Gilson Brothers, Inc., Fredonia, Wis.; Lion Gardner, vice-president, Jaeger Machine Co., Columbus, Ohio; W. B.

Directors and officials of National Gypsum Co., inspecting the recently modernized Bellefonte lime plant. Left to right: Bayard Magee, Bellefonte plant manager; G. H. Tarbell, vice-president; W. L. Jurden, production manager; R. F. Burley, vice-president; W. M. Currie, president of Currie Products, Ltd.; E. E. Finck, general counsel; J. A. W. Iglehart, partner of W. E. Hutton & Co.; and Melvin H. Baker, president of the National Gypsum Co.

Knickerbocker, president, Knickerbocker Co, Jackson, Mich; George J. Dimond, manager, Mixer Division, Koehring Co., Milwaukee, Wis.; Walter Muller, president, Ransome Concrete Machinery Co., Dunellen, N. J.; H. E. Smith, president, T. L. Smith Co., 3835 North 32d St., Milwaukee, Wis.; H. E. Moor, president and general manager, Lansing Co., Lansing, Mich.; N. Essick, Essick Manufacturing Co., 1950 Santa Fe Ave., Los Angeles, Calif.

PORTABLE ROCK CRUSHER MANUFACTURERS: David B. Cook, owner, Acme Road Machinery Co., Frankfort, N. Y.; E. N. Brooks, president, Brooks Equipment and Manufacturing Co., Knoxville, Tenn.; J. H. Fisher, consultant, New Holland Machine Co., New Holland, Penn.; Kenneth Lindsay, vice-president, Iowa Manufacturing Co., Cedar Rapids, Iowa; Gerald Smith, executive engineer, Smith Engineering Works, Milwaukee, Wis.; L. W. Yerk, president, Pioneer Engineering Works, Minneapolis, Minn.; W. P. Gruendler, Gruendler Crusher and Pulverizer Co., St. Louis, Mo.

Memorial

COL. ROBERT H. MORSE, president and general manager of Fairbanks, Morse and Co., Beloit, Wis., has created the John Morse Memorial Foundation to his son, who was killed in an automobile accident in San Francisco about a year ago. The son at that time was assistant manager of the firm's San Francisco branch. The first project of the Foundation is the erection of a new hospital at Beloit, Wis.

Prepares Concrete Manual

J. C. SPRAGUE, Development Engineer of the Dravo Corp., Keystone Sand Division, Pittsburgh, Penn., has prepared a folder, "Purpose Concrete," that contains much information of value to concrete engineers and companies dealing in concrete. Included are mix charts worked out for different kinds of construction and for local exposure conditions. Mr. Sprague was also the author of an article, "More About Concrete," which has been reprinted from the June, 1942, issue of *The Pennsylvania Construction Digest*.

Heads Elks

WALTER G. PENRY, president of the Penry Stone, Sand and Gravel Co., Radnor, Delaware County, Ohio, has been elected president of the Ohio Elks Association.

Heads Oregon Cement Company

FRANK E. MCCASLIN, a brief announcement of whose appointment to the presidency of the Oregon Portland Cement Co., appeared in the October issue of Rock Products, has served his company 20 years, the past two years as vice-president and secretary-treasurer and prior to that as secretary-treasurer. He came to Oregon from Texas in 1922. In the last World War he was over-seas with the Quartermaster Corps for 22 months.

Frank E. McCaslin

Prior to the war he was employed in Civil Service in Washington, D. C. Mr. McCaslin was born at Lake Wilson, Minn., November 2, 1897. In addition to the appointments of other officials mentioned in the November issue of Rock Products, H. L. Knappenberger has been promoted to vice-president and sales manager.

Civic Honors

CLARENCE H. GRUNERT, manager of the Shelton Concrete Products Co., Shelton, Wash., has been made a member of the city council. Mr. Grunert has been a resident of Shelton for the past eight years, serving as manager of the concrete plant since arriving there, and has been active in municipal and fraternal affairs as a member of the Kiwanis club and Masonic lodge, and more lately with civilian defense work.

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J. J. URSCHEL, president of the Woodville Lime Products Co., Woodville, Ohio, has been elected president of the board of trustees of Bowling Green State University, Ohio. Mr. Urschel's home is in Toledo. He has been a member of the board of trustees for four years, and has served as vice-president.

Lehigh Appointments

RAYMOND R. BEAR, vice-president and general manager, Lehigh Portland Cement Co., Allentown, Penn., announces the appointment of J. B. Zook to be superintendent of the Iola, Kans., plant, succeeding J. T. BeVier who retired on September 1. Mr. Zook was formerly chief engineer of the Great Lakes Portland Cement Corporation and the Lehigh Portland Cement Corporation at Buffalo, N. Y. J. Allen McGraw is assistant superintendent at Iola, Kans. Richard H. Ahrens, Davenport, Iowa, has been appointed mechanical engineer of the Iola plant.

With the Government

ROBERT D. BUTLER, assistant professor of economic geology and mineralogy at Lehigh University, has joined the staff of the metals and minerals division of the Board of Economic Warfare, Washington, D. C.

New Chief Engineer

T. A. "TED" OBERHELLMANN, with 25 years experience in designing, manufacturing and sale of crushing and pulverizing equipment, has been appointed chief engineer for the Dixie Machinery Manufacturing Co., St. Louis, Mo. Through his wide experience, Mr. Oberhellmann is especially qualified for his new position.

T. A. Oberhellmann

In Armed Service

WILLIAM J. CABANISS, formerly secretary and treasurer of the Southern Cement Co., Birmingham, Ala., is now a Lieutenant in the U. S. Navy, and has been commissioned for duty in the office of naval officer procurement in Birmingham, to take charge of the Navy's V-1 and V-7 accredited college program.

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CHARLES A. THOMPSON, of the Pittsburgh office of Robins Conveying Belt Co., Passaic, N. J., has become a Lieutenant in the U. S. Army.

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SYDNEY A. MEWHIRTER, formerly with Cia. de Cementos Portland Diamante Apulo, Colombia, S. A., is now in the service of the U. S. Army and holds the rank of Major.

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GLENN C. TRUESDELL, junior chemical engineer with the U. S. Bureau of Mines, Tuscaloosa, Ala., has been called to active duty as Aviation Cadet in engineering.

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ROBERT SCHULTZ, formerly in the sales department of the crusher division, Nordberg Manufacturing Co., Milwaukee, Wis., has been commissioned a First Lieutenant in the U. S. Engineers Corps at Camp Leonard Wood, Mo.

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J. J. DIVNEY, director of service, Marion Steam Shovel Co., Marion, Ohio, has resigned to accept a commission in the U. S. Army.

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CHARLES G. HAWES, former recording secretary of Local Union No. 50, A. F. of L., Catskill, N. Y., has been accepted for Officers' Training in the U. S. Army.

Ceramic School Changes

THE DEPARTMENT OF CERAMIC ENGINEERING at the University of Illinois started the fall session with several changes on the staff. DR. A. I. ANDREWS assumed the duties as head of the Department of Ceramic Engineering upon the retirement of Professor C. W. Parmelee. DR. A. E. BADGER was promoted from research assistant professor to research associate professor of ceramic engineering, and DR. C. G. HARMON was promoted from instructor to assistant professor of ceramic engineering. F. A. PETERSEN was appointed special research associate to continue the investigation under the Enamel Utensil Manufacturing Council Fellowship. He was associated formerly with the Florence Stove Co., Gardner, Mass. G. H. ZINK, who formerly held this Fellowship, left the staff for a commission as 2nd Lieutenant in the Cavalry. C. R. FILLIPPI was appointed an assistant in the Department of Ceramic Engineering. He was formerly associated with the Illinois Brick Co. as development engineer. A. C. OTTOSON is leaving the University to take a position with the Imperial Glass Corp.

Larger Responsibilities

DR. WILBUR A. NELSON, chief of the W.P.B. Mining Branch, has been named special assistant to W.P.B. Deputy Director A. I. Henderson to "develop a program to obtain maximum mining production." Dr. Nelson

W. A. Nelson

will take a leave of absence from the Branch, and Dr. Marcellus H. Stow, assistant chief, will become acting chief.

Promotions

JOHN F. BOYD, formerly chief chemist of United Feldspar & Minerals Corp. at Spruce Pine, N. C., has been promoted to be director of research and development for the company. He will make his headquarters at Spruce Pine. S. G. WISEMAN, formerly assistant chemist, has been made chief chemist of the Minpro Division.

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GLENN RIPPEY, for the past 10 years field engineer for the Portland Cement Association in Tulsa and northeastern Oklahoma, has been appointed district engineer. He will direct the association's activities in Oklahoma from headquarters in Oklahoma City.

Illinois Highway Promotion

VERNON L. GLOVER, engineer of materials with the Illinois State Division of Highways since 1926, has been advanced to the post of assistant chief highway engineer. He succeeds M. J. Fleming, who resigned recently. Mr. Glover has been an employe of the department since 1917, and as engineer of materials has been responsible for inspection of all materials used in construction and maintenance of roads and bridges built by the state and by counties and cities under state supervision. He also superintended the research and investigation work performed in the highway's laboratories. He is a member of the American Association of State Highway Officials, the American Society for Testing Materials, and the American Concrete Institute

P.C.A. District Engineer

HUGH D, BARNES, regional highway engineer of the Portland Cement Association on the Pacific Coast for four years and acting district engineer in charge of the Los Angeles office since September, 1941, has been appointed district engineer. He will direct the work of the Association in southern California, Arizona and southeastern Nevada with headquarters in Los Angeles.

Development Engineer

FREMONT E. WOOD, who recently returned to the United States from Cuba, has accepted a position as mechanical-electrical superintendent for Basic Magnesium, Inc., at Luning, Nev. WILLARD P. FULLER, JR., has joined the staff at Luning as junior development engineer (petrographer and spectrographer). Mr. Fuller received his M.S. degree in economic geology from California Institute of Technology June 5 after two years as teaching fellow and graduate student.

To Arabia

JOHN W. SHOTWELL, manager of the gypsum department of the Certain-teed Products Corp., recently resigned to become assistant general manager of the Saudi Arabian Mining Syndicate, Ltd., Jedda, Hedjaz, Saudi, Arabia.

Made President

LOUIS R. MORETTI, secretary-treasurer, general manager and chief engineer of Industrial Minerals and Chemical Co., Berkeley, Calif., has been made president of the company.

Heads Incor Division

PURD B. WRIGHT, JR., division engineer for Lone Star Cement Corp., Kansas City, Mo., has been named manager of the Incor division and advertising manager, with headquarters in New York, N. Y., succeeding Dewey Thompson, who has resigned.

Buys Hospital

HENRY J. KAISER, head of The Permanente Corp., large California cement company and many other interests involved in the war effort, has added another venture to his widespread activities. He has purchased the Fabiola Hospital, Oakland, Calif., which will be modernized and reequipped to treat civilian casualties of war on the industrial front.

New Jobs

EMORY W. RUSSELL, former advertising manager of the Shoe Form Co., Auburn, N. Y., and recently an account executive of David A. Tynon, Advertising, Syracuse, has joined the Niagara Gypsum Co., Buffalo, N. Y.

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ROY C. RUSSELL, formerly assistant traffic manager of International Minerals and Chemical Corp., Chicago, Ill., has been appointed traffic manager, and SINCLAIR B. MCCOY, chief clerk of the traffic department since 1927, has been made assistant traffic manager. Mr. Russell joined the organization in 1918.

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LIVINGSTONE PORTER, JR., formerly mine engineer and geologist for the U. S. Gypsum Co., Midland, Calif., has accepted appointment as junior geologist in the Water Supply branch of the U. S. Geological Survey in Santa Barbara, Calif.

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WILLIAM F. GUENTHER is employed as assistant engineer for the International Minerals and Chemical Corp. at Mr. Pleasant, Tenn.

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J. P. DICK is employed as plant superintendent with the Dominion Magnesium, Ltd., at Haley, Ont.

Engineers' Club President

P. K. LEWIS, district engineer for the Portland Cement Association, has been elected president of the Fargo, N. D., Engineers' Club. C. B. RATHBUN was elected vice-president; WILLIAM H. PLATH, secretary, and JOHN B. JARDINE, director.

Talks on "Industry at War"

M. O. MATTHEWS, manager, Oklahoma Portland Cement Co., Ada, Okla., addressed a meeting of the local Chamber of Commerce in September on a review of industry at war. He defended all industry against various loose charges of making excessive profits, etc. More men in industry might follow his example.

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PAUL TODD, representing the Portland Cement Association, discussed the uses of cement and concrete in war and peace before the Knights of the Round Table luncheon club in Pasadena, Calif., in September.

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D. L. CHANEY, regional structural engineer, Portland Cement Association, spoke on "Effects of War Emergency on Concrete Design and Usage" before the Technical Society of Knoxville, Tenn., in September.

Wins Nicholls Award

E. G. BAILEY, vice-president, Babcock and Wilcox Co., New York, N. Y., was presented with the first Percy Nicholls Award "for notable scientific or industrial achievement in the field of solid fuels" by Eugene McAuliffe, president of the American Institute of Mining and Metallurgical Engineers at the banquet of the joint Fuels Conference of the Coal Division, A.I.M.E., and Fuels Division, A.S.M.E., St. Louis, Mo.

Resignations

J. H. SETINSKY, works manager, U. S. Gypsum Co., has resigned to become assistant to the vice-president in charge of gypsum, Pacific Portland Cement Co., Palo Alto, Calif.

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CHAS. F. JACKSON has tendered his resignation as chief engineer of the mining division of the U. S. Bureau of Mines.

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GEORGE H. THIGPEN, testing engineer for the Alabama Highway Department, has resigned to return to Birmingham as vice-president of the Southern Testing Laboratories, Inc.

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WALTER E. REDMOND, board plant foreman of the U. S. Gypsum Co. in Sweetwater, Texas, has resigned to accept a position in the explosives department of the American Cyanamid and Chemical Corp. He is stationed at Pottsville, Penn.

Retires

J. STANLEY DOWNS, superintendent Stockertown, Penn., plant of the Hercules Cement Corp, Philadelphia, Penn., has retired after 19 years of service, due to ill health. His place has been taken by WARREN L. BREINIG, who has served for many years as assistant superintendent of this plant, and is therefore thoroughly familiar with his new duties.

Chemical Engineer

GEORGE C. WILSNACK, formerly with the Edison Cement Co., has been appointed chemical engineer for the Ideal Cement Co., with headquarters at Ft. Collins, Colo., according to an announcement by J. F. Kaufman, chief engineer.

To Brazil

K. G. SCHWEGLER, president of the Silica Company of California, San Francisco, Calif., has left for Brazil where he will act as chief production specialist of the Division of Metals for the Bureau of Economic Warfare.

With W.P.B.

THOMAS MATCHETT, president, Robins Conveying Belt Co., Passaic, N. J., has been appointed to the Conveyor and Mechanical Power Transmission Industry Advisory Committee of the War Production Board. R. W. EICHENBERGER and E. C. SALZMAN, Passaic, N. J., who have been with the company since 1910, and J. F. MEISSNER, Chicago, Ill., who has been associated with the company since 1916, have been elected vice-presidents. HAROLD VON THADEN continues to be first vice-president.

Flotation Work

F. A. NEWQUIST is now in Golden, Colo., doing flotation test work at the Colorado School of Mines testing plant for Basic Magnesium, Inc.

Superintend Army Project

A. HALLBERG and RALPH WIGLE are rock plant superintendents on the $14,000,000 arsenal project being built for the Army in the Sierra Nevada Mountains of California.

Technical Adviser

DAVID G. KENNEDY, for seven years production and sales manager for E. I. du Pont de Nemours & Co., Inc., on the Pacific Coast, has been transferred to Washington as a technical adviser in the company's war service department.

Incendiary Bomb Protection With Packaged Sand

California sand and gravel companies sell packaged sand to householders through distributing agencies

By LUCIUS S. FLINT

BY EQUIPPING the public with sand for fighting incendiary bombs and by making possible quick construction of durable sand-bag emplacements for protection of war-material factories, transportation and communication centers, army forts and gun emplacements, the sand and gravel companies of California are taking an important part in the job of making the Pacific Coast safe against enemy attack.

Two methods have been recommended by the army for fighting incendiaries: a fine spray of water and dry sand. The latter is, of course, preferable from several standpoint:

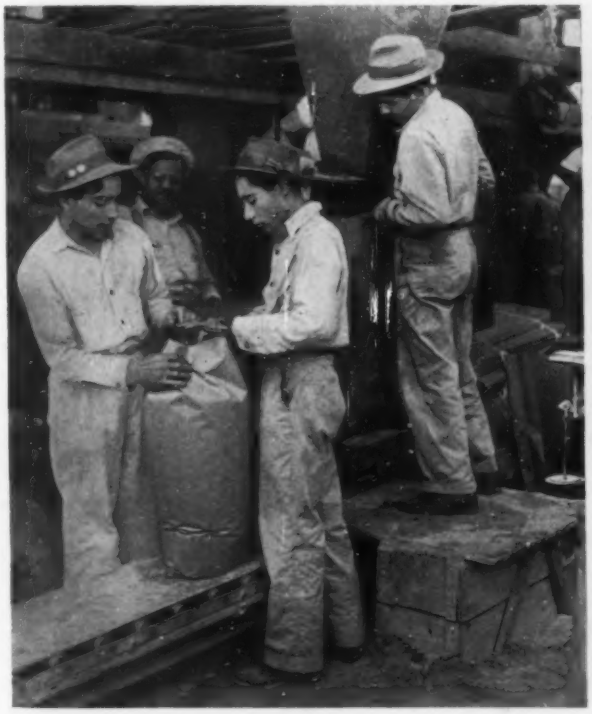
(1) Unlike hose, which is scarce and costly, sand is very inexpensive.

(2) A container of sand can be moved easily.

(3) Sand, properly used, makes it possible to get a fire bomb out of a

Woman pouring dry sand from package to pail for use in attic

Sealing paper bags containing sand with sewing machine. Conveyor brings sacked sand to machine



Left: Bags of sand are hand-filled and sent on their way by conveyor. Right: Hand trucks are used in moving sacked sand into storage

building while the missile is still burning.

(4) The sand method of extinguishing a bomb is practically fool-proof; water, on the other hand, will cause the bomb to explode unless it is used correctly and of course caution is often forgotten during moments of excitement.

The joint problem of civilian defense authorities and the rock products companies was to get people to equip their homes and business places with sand and to keep it stored properly—so that it wouldn't become damp and ineffective. And with the war still far from our shores, that's been a job.

An idea of the importance of the merchandising operation in this task may be had from the results of a municipal campaign to place free sand in every home in Los Angeles. City trucks hauled tons of sand to hundreds of school-houses. People were asked to bring salvage—old paper, metal and rubber—to these points and to exchange it for incendiary-bomb sand. But there were thousands who failed to take advantage of the offer.

Many of those people are buying sand rather than getting it for nothing—simply because attractive packages help sell them the idea and because it's more convenient to get it this way. Thus, the merchandising effort of the sand and gravel companies is doing a really essential civilian defense job as well as making extra profit for the industry.

Of course there is still much work to be done. Not unless our shores are actually raided will every home be equipped to fight incendiaries. But every air-raid scare, every blackout creates a few more converts.

Here's a principle to keep in mind if the need for this type of work should ever extend inland—push sand while people are worried. See that dealers get adequate supplies the day after every blackout. That's when it sells, not between times.

Paper Packages

The first problem was to find packages suitable for display and storage use. Since the sand becomes useless when even slightly damp, the container had to be proof against even the moisture in the air. It also had to be light, durable and clean. The answer was found—through coöperative research—in a new type of paper bag.

This package, which is also being used widely in the embankment installations, consists of five tubes of heavy paper one inside the other. Three layers are of regular, heavy Kraft, two of asphalt laminated paper.

The bottom ends of the bags are closed with sewed stitches — heavy thread—through a binder of heavy paper tape, this operation being performed by the bag manufacturer. After the bags are filled with sand, the upper ends are sewed in the same way. Sewing machines have been installed at the gravel plants for this purpose.

Bags opened after several months of storage under all kinds of weather conditions have been in perfect condition, with the sand just as dry as when put in. Besides providing perfect protection for the sand, the bag is sturdy enough that there's virtually no danger of breakage. And since it prevents even the finest sand from filtering out—as with burlap or even canvas—it's a clean package that can be stored anywhere in the home.

The paper bag has still another important advantage in that its surface can be used for advertising. These bags are imprinted with a fire illustration and a list of official rules to follow in fighting incendiaries.

Radio Advertising Dealer Displays

One producer who has been particularly active in merchandising this package for home use had to buck a lot of opposition to put it across. To test public reactions, the company first placed a specialty man, armed

Illustrating the inconvenient way of handling sand for incendiary protection

with sample packages, on a downtown parking lot. He made practically no sales at the outset and was called everything from a war-monger to a profiteer and a pirate.

Realizing that the proposition was a ticklish one, the company decided to launch an educational campaign. Two radio spots a day were taken on metropolitan stations and display advertisements were inserted in community newspapers. Copy stressed the idea of protecting the home—the theme that we don't care whether you buy it from us or not but get sand and get it now. The convenience of the package was bound to create a good business if the public could only be sold on the idea that sand was necessary.

That campaign accomplished a lot. But still there was public inertia. So the company finally adopted a policy of timed merchandising. After every blackout, supplies for mass displays are rushed to dealers and radio spots are put on the air. Between times dealer displays are relied on.

Since this company features a 50-lb. bag, which is the quantity recommended for home use, it was found that dealers who can carry the package to the customer's car are the "best bets." This group includes garages, service stations and very large supermarkets which use "box boys." Drug and variety store outlets haven't worked out well.

Small Carton Packages

To overcome the size and weight handicap, another producer introduced a new type of package—one that's getting a good opening play in all kinds of small retail stores. It's a moisture-proofed paper carton measuring 8 in. in all dimensions. All openings are taped. The top of the carton uses an odd fold which forms side pouring spouts when the package is opened. This package holds 25 lb. of sand, a quantity sufficient for handling at least one incendiary bomb.

One side of the carton is imprinted with a fire design and the eye-catching name, "Bomb Smother." Other surfaces are devoted to rules for handling incendiaries, advertising featuring the "Be prepared" slogan and promotion of the company label and its list of other rock products items.

Both these packages naturally show both the gravel company and the dealer a good profit and yet are sold at an economical price. The 50-lb. sack, for instance, retails at 49c—the odd cent price being used for psychological reasons.

Cost of materials is relatively small. The bags cost the processor 4c each, the cartons considerably less.

Types of sand used vary somewhat, although most any clean, water-washed sand (or crushed stone sand) which is perfectly dry is satisfactory. One features pulverized granite. Another uses the same type of silica which is employed in moulding iron. The material is heat treated before packaging to make certain it's perfectly dry.

Development of the paper bag for incendiary bomb sand has benefited producers in the handling of many other products. One producer, for instance, is employing them for practically all of its specialty sands—play sand for children's sand boxes, sand for sand-blasting, grinding pebbles and filter rock.

In view of the shortage of burlap, paper is proving a valuable substitute. Further, the paper bags pack more evenly on the trucks, are cleaner to handle and don't involve a tearing or breaking hazard. Department stores which formerly couldn't display sand in their toy departments because it was dirty to handle are able to show it in the paper bags.

But even more important has been the performance of the paper packages in embankment installations. The idea was first tried out at a California army fort early in December. The bags put up there are still in excellent condition and now the aircraft plants and other war factories are buying them by the hundreds of thousands. One plant alone has taken an estimated 500,000 bags.

The bags used for defense purposes are mostly in the 100-lb. size. They're used for both exterior and interior sand-bagging, for reinforcing shelter areas, for protecting gun emplacements and so on.

The layers of asphalt laminated in the paper bag have proved perfectly adequate in keeping the bag intact under heavy rain and other weather hazards. The big advantage of this container is that it doesn't mildew when moist as does burlap.

While some plants are still using canvas, performance indicates that the paper will prove even more desirable than this material, as it also

(Continued on page 38)

Attractive packaged sand used for incendiary protection. Advertising literature shows how sand is more effective than water

SEND **ROCK PRODUCTS** *for*
TWO YEARS *at* **$3. MAIL INVOICE**

or Check here ☐ for ONE YEAR *at* $2.00

Name_____

Street & No._____

P. O._____ State_____

Company_____

Your Position_____

CANADIAN RATE
SAME AS U. S. A.

COUNTRIES IN POSTAL
UNION SAME AS U. S. A.

FORM 9151 R.P. 11-42

FIRST CLASS
Permit No. 1417
(Sec. 510, P. L. & R.)
CHICAGO, ILL.

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States

2 CENTS POSTAGE WILL BE PAID BY—

ROCK PRODUCTS

309 WEST JACKSON BLVD.

CHICAGO, ILL.

Business Is War — In the West

Rock products plants in the west busy on war contracts. Labor scarcity and fuel shortages are problems

By RALPH S. TORGERSON

With every "click" of the rails bringing the traveler to the West Coast, there are evidences of an ever-increasing tempo of war activities affecting the rock products industry. Milling crowds in the cities are predominantly members of the army, navy, and marine corps or the countless male workers in tin hats or women workers in slacks. Shipyards, airplane factories, steel mills, aluminum and magnesium plants, and ammunition factories have all contributed to the almost unprecedented demands for cement, gypsum, lime, sand and gravel, crushed stone, concrete products, and many other non-metallic minerals almost too numerous to mention. On top of this industrial call for materials, the armed services have used vast tonnages for airports, fortifications, barracks, access highways, and strategic highways across almost impassable terrain, such as the Alaskan highway.

In the Northwest Pacific area, there has been a tremendous increase in war-time activities since Pearl Harbor. The armed services have taken the very wise strategic move of dispersing many of the airports and other military establishments to interior points in Washington, Idaho and Oregon. Similar action has been taken with respect to aluminum and magnesium plants. This has brought about industrial booms in these cities which have carried business "barometers" to heights never reached in the past.

Cement companies in these interior centers have had all their production restricted to projects having the highest priorities, and it has been necessary to ship in cement from the Coast mills to fill the gap. Storage bins have been scraped to the bottom with new production from the clinker mills moving directly into cars and bulk-cement trucks. In some cases trouble has arisen with cement arriving so hot at destination that it could not be used until it was allowed to cool. Cement is handled in bulk from plant to construction site, and many ingenious devices have been developed to transfer the cement from cars and trucks to storage facilities, some of which will be described in more detail in ROCK PRODUCTS. Long distance rail hauls of cement from Coast mills to interior points have been made on federal land-grant rates, the government accepting the cement at f.o.b. plant prices. This movement of cement from Coast mills to interior points also has placed a strain on their production facilities so that many of these mills had very little cement in storage. In the Pacific Northwest, the opinion seemed to prevail that construction activities would probably keep cement mills at nearly peak capacity until about July 1, 1943.

Aggregates producers in this area have been extremely busy. Concrete pipe manufacturers who have enjoyed perhaps the largest demand in history during the past two years report the volume falling off slightly with the completion of some of the large airports. Producers of concrete block and other masonry units have had more business than they could handle, and some rail shipments have been coming in from other States. Most of the concrete block have been shipped to army and navy projects or war industry construction. Bomb shelters, ammunition dumps, and airplane engine testing tunnels also have been important consumers of concrete products. An insulated, so-called acoustic block has been developed for the airplane testing tunnels.

Good Business Also Brings Troubles

This great expansion in business also has brought in its wake many trials and tribulations for the rock products industries. High wages in the shipyards and airplane factories and the draft deferred status enjoyed by workers in these industries have siphoned labor away from mines, quarries, cement mills, sand and gravel pits, and concrete products plants. So serious has this problem been that production has been curtailed and even shut-downs have been threatened. Cement mills in the Pacific Northwest use coal almost exclusively for fuel and with coal mine production cut almost in half due to lack of labor, some kilns have had to be shut down temporarily until sufficient fuel was available. One cement company which formerly obtained part of its limestone supply from Alaska had to find a new source of supply when the government commandeered its vessels.

Very little complaint as to W.P.B. priorities was found among producers who sought repair parts, but considerable difficulty has been experienced in securing essential new equipment. However, new equipment is being obtained where a complete breakdown has occurred and the machinery is required to maintain production on war orders. Some of the troubles of producers in obtaining new equipment have been the result of improper presentation of the need for this machinery. An improvement program at one cement company quarry has been held up due to the difficulty of getting machinery, although the government is obtaining dolomitic limestone from the same quarry for use in processing magnesium metal. A company making magnesite refractory materials has not been able to secure all the equipment to complete its plant improvement program although refractories are prime necessities in the metallurgical industry.

Farther down the Coast into northern California as far as San Francisco, almost the same conditions of labor scarcity and high rates of production for the rock products industries continue to prevail. The big water conservation and power projects, such as the Shasta dam and other Central Valley projects, take tremendous quantities of cement. This work, which will take almost another two years to complete, on

top of many airport and cantonment jobs have been keeping cement plants and aggregates companies working at peak capacity. Ready mixed concrete plants have been working around the clock to supply materials for the construction projects of the different armed services. Some concern is being expressed as to how plants operating in the more isolated areas may obtain tires for their trucks. Branch lines of railroads have ceased operation and tracks have been taken up in the scrap drive so that transportation is almost wholly dependent on trucks. Machinery also is wearing out at a much more rapid rate than under normal operating conditions. One cement company has resumed operation at one of its plants which has been idle for ten years. However, it will be necessary to transport the clinker from the reopened plant to its other plant as it was not possible to secure new mills. The old mills had been removed to the other plant.

Price Squeeze in Aggregates

In the southern California area, the construction work is much farther advanced, and opinion seems to prevail that unless other government projects are approved, peak production cannot be maintained beyond December 1, and that most of the present projects, other than dam construction, will be cleaned up before the middle of 1943.

Aggregates producers' profits in this area have been squeezed between the fixed prices under O.P.A. orders and high wage rates. Only the tremendous volume of business has saved these companies from serious difficulties. Prices of aggregates were abnormally low in this area due to price wars, and the fixed prices established by O.P.A. were particularly onerous when wage rates began their spiral climb.

Labor Migrates to Coast

Colorado and Utah areas also are experiencing boom times in the rock products industries. The shortage of cement has been so pronounced that mills as far away as New York and Pennsylvania have shipped into this area. On the other hand, mills in the mountain states have been shipping into Nebraska and Iowa on war order commitments made before the local demand became too great to fill from local mills. However, a falling off in demand is indicated this Fall and a considerable part of the construction work will be completed before the first of the year. There is practically no cement in storage, and mills in these two States will be kept busy for a considerable time building up storage reserves against any heavy demands which may develop in 1943. Labor in this area is scarce due to the numerous war industry and army construction jobs and to the migration of workers to the Pacific Coast. Lime companies have been busy supplying the chemical and metallurgical industries, and the sugar industry has taken a large tonnage of crushed limestone. Ready-mixed concrete producers have been very active until this Fall with war construction work. Although building construction has fallen off rapidly, the concrete products plants have been very active wherever they were large enough to guarantee deliveries of tested units in the quantities scheduled for the job. Smaller plants unable to meet the requirements have not fared so well.

Taking Plant to Job

One of the most significant developments in the industry in the West has been the tendency in many sections for aggregates producers to take contracts in areas at considerable distances from their permanent plant locations. For example, an aggregates producer in one of the Pacific Northwest cities along the coast took a large contract to supply crushed stone to a government project nearly 300 miles from his permanent plant.

Incendiary Bomb Protection Sand

(Continued from page 36)

has a tendency to rot and mildew after long exposure. In some instances, defense plants are coating the outsides of the paper bags with asphaltic paint as an extra precaution; but this hasn't proved necessary.

To give the sand necessary body for this usage, it's put into the bags with a moisture content of from 3 to 4 percent. But even this internal moisture has had no effect on the paper after six months of usage; the inside layer in bags just opened is still perfectly dry.

Filling and Sewing

Filling and sewing of the bags is a simple operation. A hopper filled with sand is installed above a rack which holds the bag open—in vertical position. To release a pre-weighed amount of sand into the bag, the operator simply pulls a lever which swings out the cover plate from the bottom of the hopper.

A belt conveyor begins just beyond the hopper. As the bag is filled and drops on the conveyor, two men shape it and pull the top edges together. The filled bag then travels along the conveyor to a point under a sewing machine head where the top is stitched shut.

Men with hand trucks are stationed at the end of the conveyor to remove the bags to waiting trucks. Despite a labor shortage, one plant has developed a capacity of 30,000 bags per day—that's based on 24-hour operation.

Night lights are shielded so that it's possible to continue work during blackouts. Due to a heavily increased demand following the Dutch Harbor attack, every plant specializing in this line is working to capacity to fill orders.

Building Market

A strong market for incendiary bomb sand has also been developed among the hundreds of public and business buildings throughout this area. Single large stores and office buildings buy a ton to several tons of sand for covering their roofs or filling sand buckets.

One large chain organization has completely covered the roofs of several stores with sand to a depth of about 14 inches. Of course only a very strong roof will stand this weight, but it's a desirable protective proposition where practicable.

Many other commercial roofs are equipped with dozens of sand buckets, sometimes covered garbage cans, again ordinary water pails with second pails on top to shield the material from moisture. Most large buildings are very well protected on this score.

Probably the most unusual "stunt" involving incendiary bomb sand was that of a Los Angeles hardware dealer who offered free sand to anyone who would come and get it. Located in an air-raid-conscious neighborhood, he has so far given away about three tons in 25 to 50 lb. lots. The sand costs him $3 a ton and it's brought him several thousand dollars' worth of extra business on other air raid merchandise.

DIRECTORS, N.S. & G.A. CANVASS SITUATION

ONE of the most interesting and successful board meetings the National Sand and Gravel Association has ever held was on October 1 and 2 at the Hotel New Yorker, New York City. Including the chairman, Otto S. Conrades, president of the Association, 22 directors and 15 guests attended.

One of the main topics discussed was the present and future financial outlook for the Association. Its present financial statement presented by Stanton Walker, is the best ever, and $10,000 was set aside as the nucleus of a special fund to assure continuation of its research activities in the war years immediately ahead, when the volume of production may decrease very rapidly with the completion of war construction. We said "nucleus" of a fund, because the discussion proved that in the unanimous opinion of the directors, a fund nearer $50,000 should be established.

Another subject discussed at some length was a program for the annual convention in Cleveland, next January 27 to 29. Executive Secretary V. P. Ahearn said he could see nothing in the present situation which would prevent holding conventions of industry, such as this, since they gave the federal government an opportunity for much needed contacts with leaders of industry at the least expenditure of their time and effort.

IRWIN F. DEISTER, chairman of the Manufacturers' Division, reported the results of the special meeting of the Division, held the previous day (and reported elsewhere in this issue). The voluntary doubling of the dues of the associate members, by their own action, was gratefully acknowledged by the members of the board of directors.

The rest of the sessions, aside from Stanton Walker's report on research activities, had to do with interpretation and explanation of the various rules, regulations, priorities, etc., under which all industry is compelled to operate. As usual, Executive Secretary Ahearn's explanations and comment were enlightening and interesting and helpful. Also present at one session were E. W. Bauman, representing the W.P.B. and T. R. Boyd and Roy S. Parsons, representing the O.P.A.

Attendance

The following directors were present: Otto S. Conrades (president), St. Louis, Mo.; H. N. Snyder (secretary-treasurer), Buffalo, N. Y.; T. E. Popplewell (executive committee), Fort Worth, Tex.; Robert Mitchell (executive committee), Los Angeles, Calif.; John M. Settle (executive committee), Louisville, Ky.; W. A. Bliss, Pittsburgh, Penn.; R. N. Coolidge, Nashville, Tenn.; F. D. Coppock, Greenville, Ohio; Anderson Dana, New York City; Irwin F. Deister, Fort Wayne, Ind.; Floyd C. Fuller, Portsmouth, Ohio; B. V. Hedrick, Lilesville, N. C.; Daniel J. Miller, Portland, Penn.; J. P. Eyre Price, Scranton, Penn.; John Prince, Kansas City, Mo.; F. P. Spratlen, Jr., Denver, Colo.; E. L. Wade, Baltimore,

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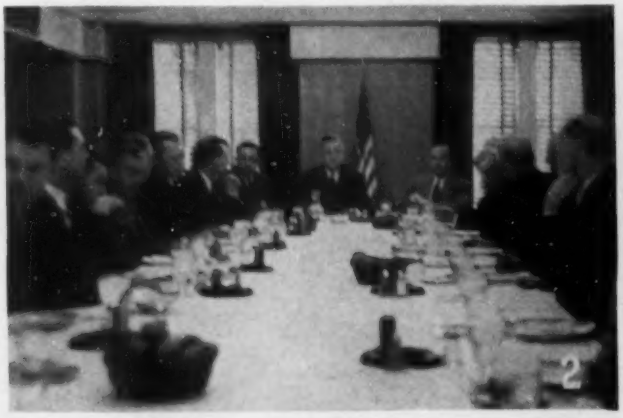


Fig. 1, left to right: Daniel J. Miller; E. L. Wade; J. Rutledge Hill; E. W. Bauman, Mine Priorities Branch, W.P.B. Fig. 2: A dinner table gathering. Fig. 3, left to right: T. R. Boyd, O.P.A., Robert Mitchell, F. P. Spratlen, Jr. Fig. 4: Stanton Walker, T. E. Popplewell

GRINDING

Calaveras Steps Up Production

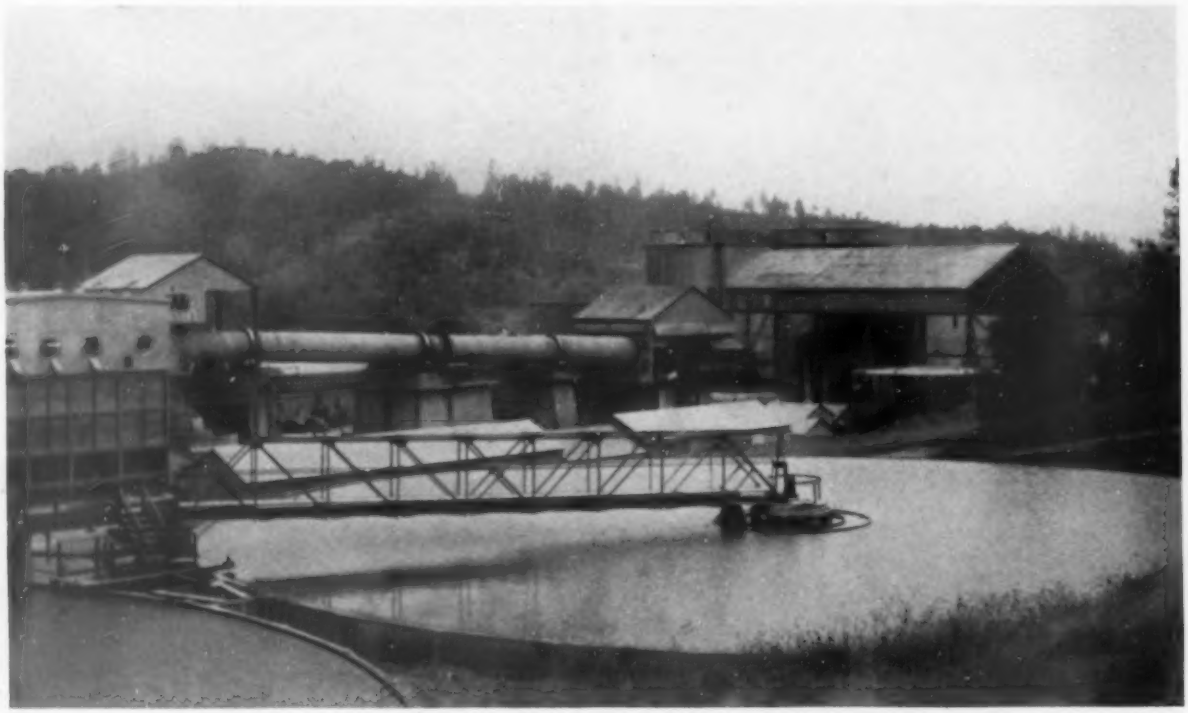
Improvements include new tertiary crushers, bowl classifiers, thickeners, and air-quenching clinker cooler. Also add new motor truck maintenance facilities

INCREASED raw grinding capacity, increased clinker production, and more efficient finish grinding have been the major results which have followed the installation of new classifier equipment and clinker coolers at the San Andreas plant of Calaveras Cement Company, San Francisco, Calif. Other important additions to equipment which have contributed to these desirable results include two tertiary crushers that follow the primary gyratory and two 10-in. secondary mills, and the use of feedoweights to more accurately control the raw feed to the compartment mills.

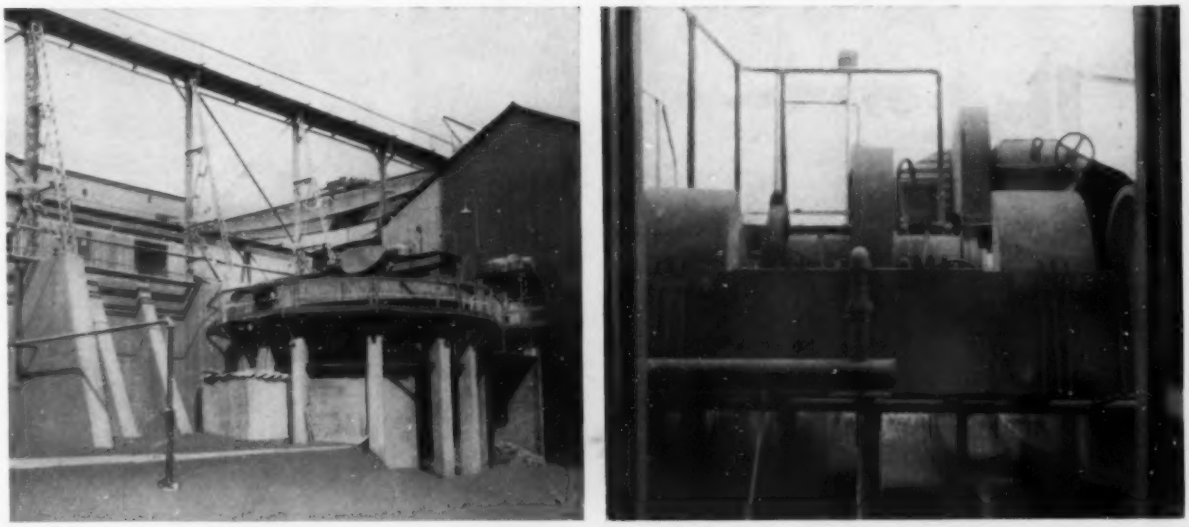
These improvements are all part of a general program laid out for the future of the San Andreas, Calif., plant which went into operation in June, 1926. The company is an important producer of white cement as well as the various types of gray cements. At present, however, operations are almost entirely devoted to high priority war orders, principally for Types Nos. 1 and 2. White cement is made in the same kilns as the gray cements from selected very light, pure limestone, for which its quarries are famous.

In the accompanying flowsheet may be seen the present raw grinding setup which started in operation early in June this year. Crushed rock is prepared for the raw grinding department by a 42-in. McCully gyratory crusher, two 10-in. Allis-Chalmers fine grinding mills, and the two new Allis-Chalmers No. 322 Type R tertiary crushers which provide an ample capacity of minus 1-in. raw feed. The Type R crushers have a capacity of 35 tons per hour with 85 percent passing ¾ in.

There are two complete raw grinding closed circuits, one for each of the two wet process kilns. Crushed rock is moved by belt conveyor passing through a Merrick feedoweight which records tonnage ground and keeps a maximum steady feed to the 8- x 7- x 16-ft. Allis-Chalmers two-compartment ball mills. The crushed



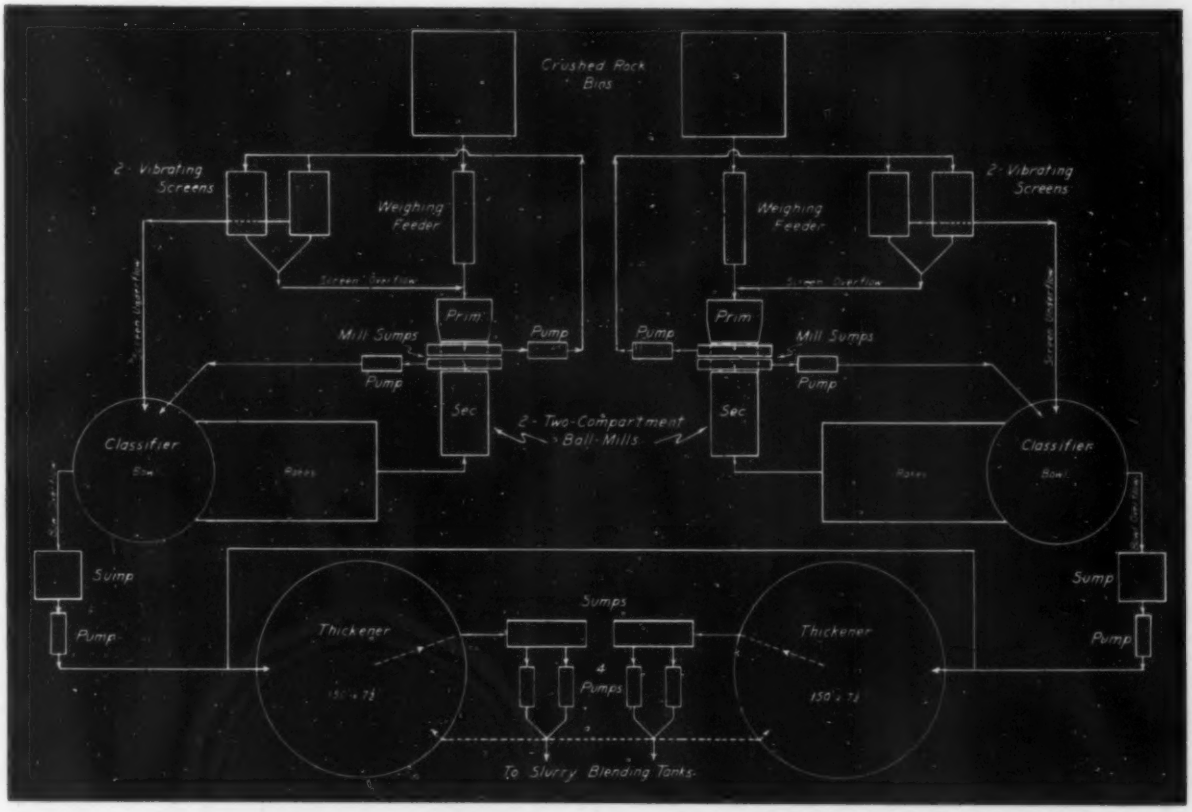
Two new 150-ft. thickeners in the foreground and general view of plant, showing two kilns and slurry blending tanks



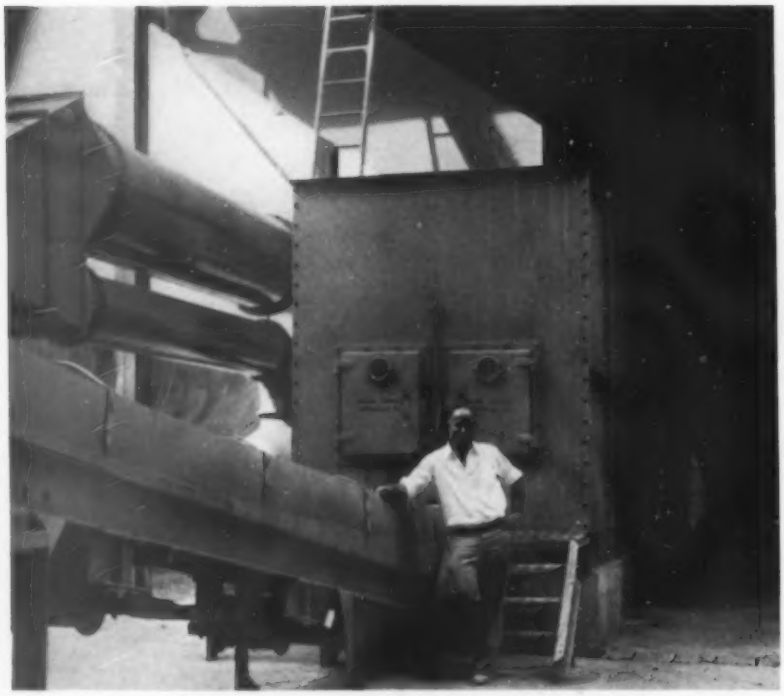
Left: Close-up of one of the two bowl classifiers with sand rakes toward mill building. Right: Showing bowl classifier rakes in action

stone is fed to the primary compartment of the mill where the product is taken from the mill sumps and pumped to two Hummer vibrating screens. Underflow from the screens goes to the Dorr bowl classifier and the overflow is returned to the primary compartment of the mill for further grinding. Rakes remove the sands from the bowl classifier which flow by gravity to the secondary compartment of the ball mill. The product of the secondary compartment is returned by pump from the mill sump to the bowl classifier.

Overflow from the Dorr bowl classifier is pumped to the Dorr thickener where the water content is reduced



Flow sheet of wet grinding and slurry treatment at San Andreas, Calif., plant of Calaveras Cement Co.



Air quenching clinker cooler with conveyor taking clinker to clinker storage. George Poore, Jr., superintendent, standing in front of cooler

to about 35 percent before the slurry is pumped to the blending tanks for kiln feed. Slurry from the blending tanks is fed to the kilns by the customary ferris wheel equipment. Both Wilfley and Western Machinery Co. (Wemco) slurry pumps are used.

The new raw grinding arrangement and the additional classifying equipment has worked out very satisfactorily. Grinding water was increased from 35 percent to 85 percent, and mill output was stepped up very materially. Fineness of grinding was increased from 88 percent through 200-mesh to better than 95 percent passing 200-mesh.

Beneficial results also have been noted in the kiln operation due to the increased fineness and the blending effect of the tremendous slurry reserve in the 150-ft. thickeners.

Cooler Improvements

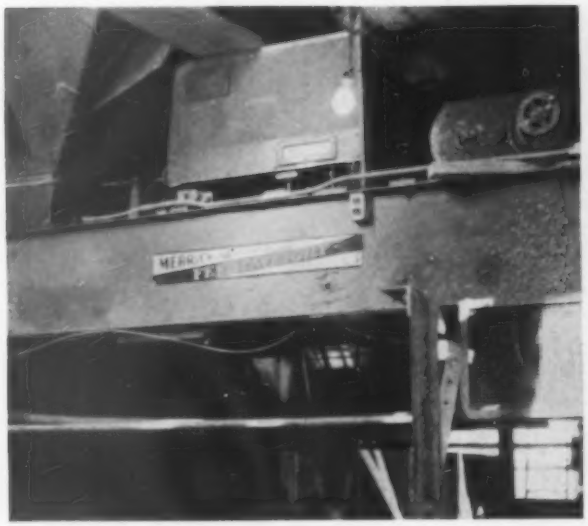
In the kiln department, a Fuller clinker cooler has replaced the old rotary cooler. The new cooler serves one of the two gas-fired 11-ft. 3-in. by 10-ft. by 240-ft. kilns. The total annual output is approximately 1,400,000 bbls. Clinker leaving the cooler has a temperature of 220 degrees F.

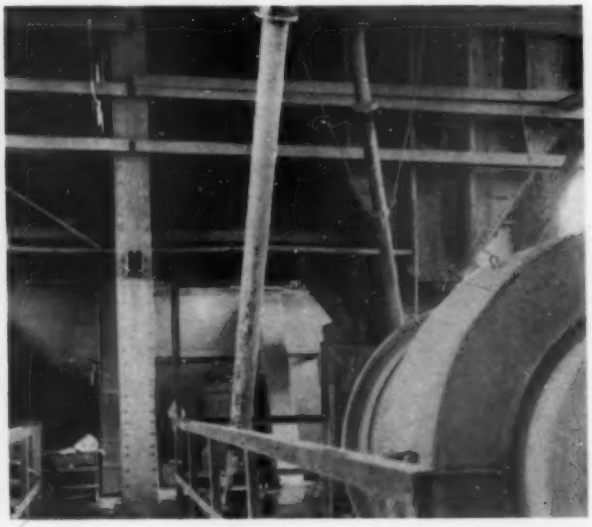
With the new cooler, an increase in kiln capacity has been noted. The air-quenched clinker also has been found to grind much easier in the finish mills.

Truck Haulage Facilities

Although every effort is made to reduce truck haulage of cement to a minimum as a means of tire conservation, a certain percentage of the shipments cannot be made by rail due to the inaccessibility of the delivery points. The Calaveras Cement Company recently completed the construction of a new truck and trailer maintenance and service building at San Andreas, Calif., to care for this equipment. This structure has a drop pit for making inspections and repairs, hoisting equipment, and tools for all repairs, except engine overhaul work.

Eight modern Diesel tractor and trailer units are operated out of this plant for both bulk and sack delivery of cement. The illustration shows one





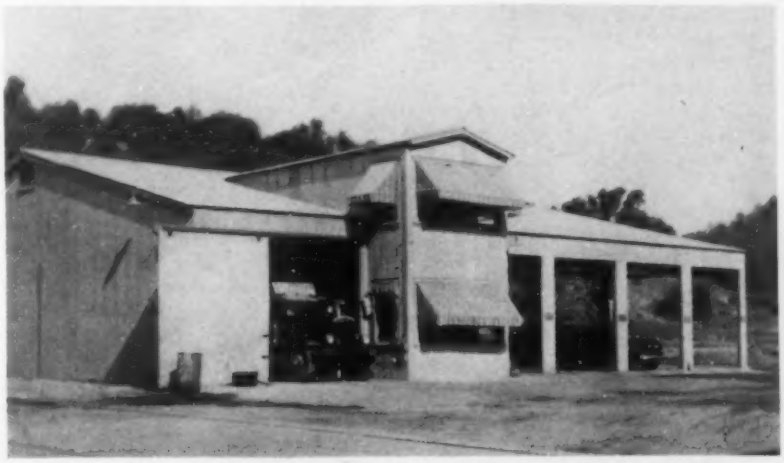
Left: Feedoweight which records tonnage and keeps a maximum, steady feed of crushed rock flowing to the compartment mill. Right: One of the two wet compartment mills

of these haulage units with bulk cement tanks that hold approximately 125 bbl. in four tanks. These tanks are quickly filled and easily delivered to the job by means of hoisting equipment.

Officers of the Calaveras Cement Company are Wm. Wallace Mein, president; W. W. Mein, Jr., vice-president and purchasing agent; H. C. Maginn, vice-president and sales manager; J. B. Smith, treasurer; J. Tedesco, secretary; Carl M. Price, chemical engineer and technical adviser; Geo. B. Poore, Jr., is superintendent of the San Andreas plant.

Above: Tractor-trailer combination hauling bulk cement in tanks

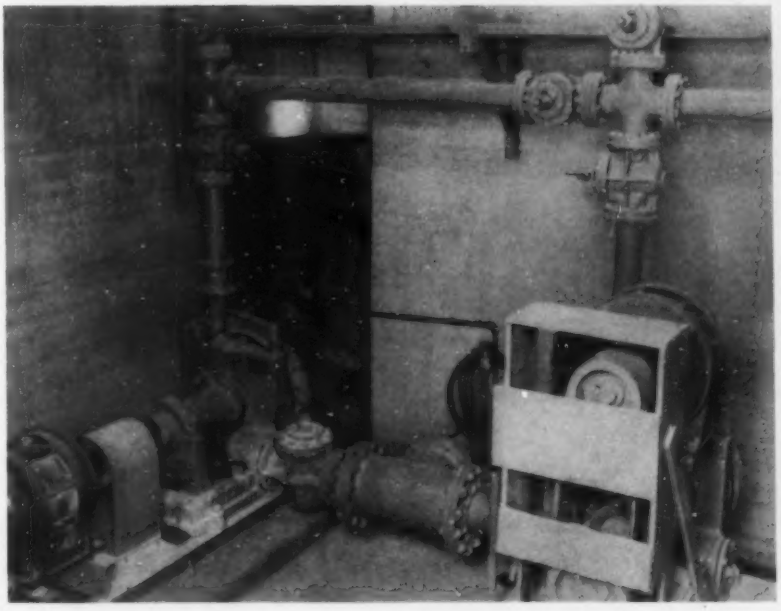
Below: Truck and trailer maintenance building at San Andreas, Calif. Garage to the left, office and storeroom in the center, and drop pit and repair facilities to the right



Powdered Feldspar for Incendiary Bombs

NEW SCIENTIFIC TESTS showing that feldspar, a common rock mineral, contains valuable properties for extinguishing incendiary bombs recently came to light.

Crystalline lumps of feldspar ground into powder provide the most satisfactory material so far known for extinguishing magnesium incendiary bombs, it was reported by Drs. W. W. Rubey, Michael Fleischer and J. J. Fahey, of the United States Geological Survey laboratories.



Unique Suit

KELLY ISLAND LIME AND TRANSPORT Co., Cleveland, Ohio, is being sued by a couple of citizens of Shaker Heights in an unusual if not unique action, which must have been prompted by something other than civic zeal.

The plaintiffs maintain that the Kelley Island company, operating since 1866, has been removing materials from the lake illegally, and ask an accounting of all money received from the sale of such materials. They claim that the sand, gravel and other minerals rightfully belong to the taxpayers of Ohio.

Left: One side of the slurry pump house showing pump installation. There is a similar set-up on the other side

BATCHING

Processing 250,000 Tons of Aggregates

Union Sand and Gravel Co., Spokane, Wash., sets up interesting system of handling sand and gravel for large defense projects

By RALPH S. TORGERSON

When the Federal Government called upon producers of sand and gravel in the Spokane, Wash., area to furnish vast quantities of concrete aggregates for airport facilities and other war construction, the Union Sand and Gravel Co., was prepared to meet the demands. Fortunately, the management had foreseen the need for additional plant capacity and had acquired other sand and gravel properties around Spokane so that when the government called for bids the company had five plants located at convenient points and available to rail facilities.

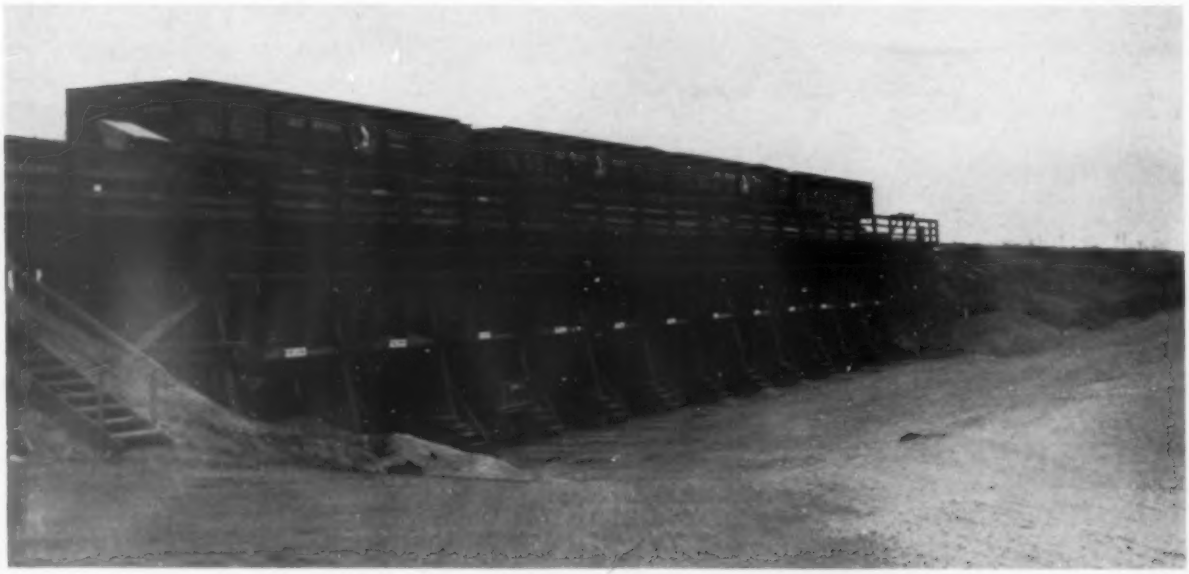
Contracts called for a total of 250,000 tons of aggregates. This strain on the capacity of the plants came on top of demands for aggregates to supply the Central Premix Concrete Co., a subsidiary ready mixed concrete company. In addition to furnishing the aggregates, the contracts include unloading, stockpiling and batching to the contractors batch trucks for the paving. Material for the buildings is handled by direct contracts with the building contractors, most of which is delivered direct to the mixers.

Working closely in coöperation with the Army Engineers Corps and the construction contractors, the Union Sand and Gravel Co., designed a system of handling aggregates which worked out very efficiently. Aggregates were drawn from all five plants. Some of the deposits ran largely to gravel and others to sand so that by drawing from the various sources the proper proportions could easily be assembled at the storage and batching facilities near the site of the construction.

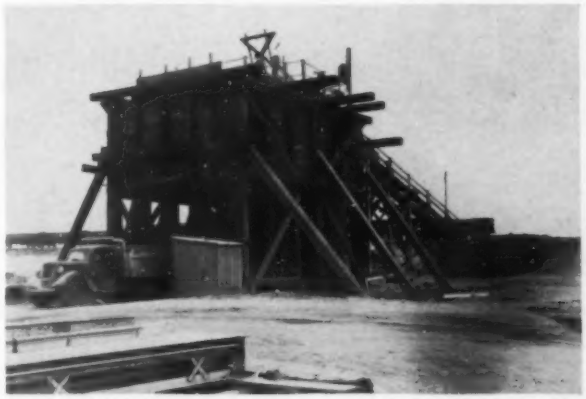
Blast Down Gravel Deposit

The gravel deposits in this area are almost a conglomerate and in many cases have to be blasted down. There is a similarity to quarry operations in this respect, and also in the high face of the pit being worked. The material is drawn by scraper bucket to a hopper feeding a conveyor belt to the plant where it is sized by vibrating screens and washed, and generally the finished material is chuted directly into railroad cars for shipment to the construction site. Demand has been too heavy to build up any plant stockpiles. One of the problems has been the difficulty of securing sufficient open-top cars. Not many changes were made in the plants except to increase capacity by the addition of two Allis-Chalmers vibrating screens, a single-deck and a triple-deck at one of the plants.

The triple-deck, 4- x 12-ft. Allis Chalmers low-head screen was installed three years ago when the company changed to vibrating screens. Before putting in the small 3- x 6-ft. Allis-Chalmers Aero-Vibe screen, five sizes of material were taken from the triple-deck screen. This was done by taking off 2½- to 1¼-in. from the top deck, 1¼- to ⅜-in. off the second



Aggregates are hauled from plants by rail over long spur track and dumped into timber bunkers holding 12 cars of material. Trucks receive loads for the batching plants by driving under the bunkers



Two types of aggregates batching plants. The plant to the left is served by a belt conveyor from rail to plant bunker, and the one to the right receives its aggregates by truck from rail bunker to batcher bunker

deck and ⅝-in. off the lower deck. The lower deck was split, one-third of which passed ⅜-in. and two-thirds of which passed minus 3/16-in. By installing the smaller screen, it was possible to have a full screen for each size of material; 2½- to 1¼-in. for the top deck, 1¼- to ⅜-in. off the middle deck (which flows onto the small screen), ⅜-in off the lower deck, and the 3/16-in. material passed through the lower screen.

As shown in the illustration, by flowing the 1¼- to ⅜-in. material onto the small screen, any desired amount of minus ⅝-in. can be taken out. There are certain parts of this pit that run strongly to minus ⅝-in. which means that the amount taken out can be varied merely by blanking out a portion of this screen. This screen installation also enabled the company to increase production 130 cu. yd. per eight-hour shift and at the same time give much better control of the gradation.

Large Storage Facilities

All aggregates move by rail from the five plants to the construction site and the cars are dumped into immense timber bunkers which hold 12 cars of material. There are four bins, each bin holding three cars. Each bin has three gates from which trucks take the different sizes of sand and gravel to be stockpiled or moved directly to hoppers or bins over the three batching plants. No elevators or conveyors are required in this part of the handling of aggregates as the trains of cars are hauled to the site over a 3600-ft. spur track with a 1½ per cent grade to the top of the timber bunkers, and materials flow by gravity to the trucks in driveways below the bins. As many as 42 cars have been unloaded in 4 hrs.

In anticipation of heavy demands, the Union Sand and Gravel Co., built up a stockpile of 60,000 tons in the Spring of 1942. In conformance with Army Engineer Corps requirements, the material was stockpiled by shovels in 4-ft. layers. This practice applies to both gravel and sand. In spite of the large bunker storage of 12 cars, the stockpile of 60,000 tons has been drawn upon frequently and has been very rapidly depleted.

Materials comprise a fine sand; a blended pit run; coarse sand; 2½-in. rock; and 1½-in. rock. Specifications of the fine sand are:

Fine Sand Specifications	
100%	passing No. 4
100%	passing No. 8
99½%	passing No. 16
92%	passing No. 28
44½%	passing No. 50
4%	passing No. 100

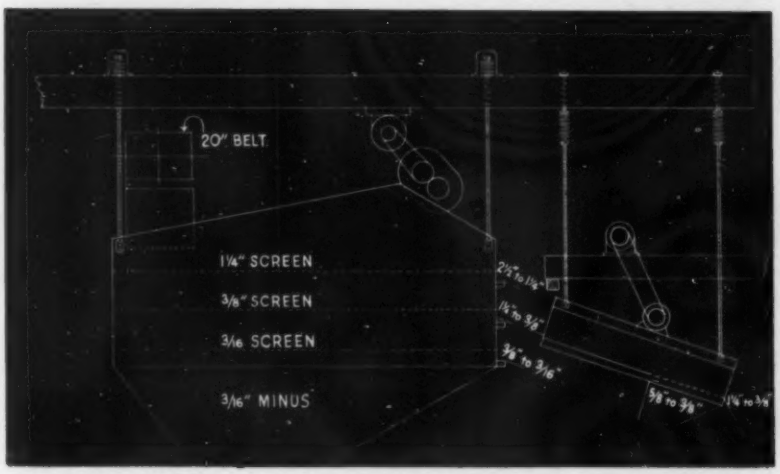
Coarse Sand Specifications	
97%	passing No. 4
81%	passing No. 8
45%	passing No. 16
10%	passing No. 28
2%	passing No. 50
½%	passing No. 100

Contractors Operate Batchers

All aggregates and cement are dry-batched from three Butler batching plants, the contractors operating this equipment. There is one 2-cu. yd. batcher and two 1-cu. yd. batchers. Trucks move aggregates from timber bunker bins or from stockpiles up earth-fill inclines to the top of bins above the batcher in the case of two of the batchers. The third batcher receives its aggregates by means of a short 22-in. belt conveyor (Rex idlers) to the top of the batcher bin.

Trucks receiving loads from the weigh batching plants are of the

(Continued on page 51)



Arrangement of vibrating screens at one of the plants which promoted an increase in production of 130 cu. yd. per eight-hour shift. The smaller single deck screen takes the 1¼- to ⅜-in. material from the triple-deck screen

Aggregates For An Earth-Fill Dam

Excavating, transporting and screening 8,000,000 cu. yd. of gravel for Santa Fe Earth Fill Dam, Southern California

THIRTY MILES east of Los Angeles four contractors with two new electric shovels are hard at work on the $8,800,000 Santa Fé dam. Their job consists of digging the river valley run gravel, which varies from fine sand to 22-in. boulders, and loading it out for ultimate use in the dam. This is the hardest assignment in all the earthwork, for the boulders are well packed and every inch has to be dug. Banks do not cave.

Calling for 14,200,000 cu. yd. of excavation, the Santa Fé dam is the largest built to date under supervision of the Los Angeles U. S. Engineer Office. An $8,800,000 contract was let on August 15, 1941, to a firm of four contractors; Morrison-Knudsen Co., Inc., J. F. Shea Co., Inc., Winston Brothers Co., Inc., and Ford J. Twaits were the joint bidders. The dam will trap 36,000 acre feet of San Gabriel river water during the heavy rains of the winter season.

These contracting firms are familiar to many readers of ROCK PRODUCTS as aggregate producers as well as contractors. Morrison-Knudsen built a good part of the All-American

A 6-cu. yd. electric shovel excavating embankment material from the borrow area. Material is hauled to the plant, shown in the distance, for separation into sizes in 12-cu. yd. dump wagons

Trucks dumping into hopper from which material is fed to the 60-in. conveyor belt, 275-ft. centers, by a 72-in. feeder

canal in California and the Anderson Ranch dam in Idaho and the Kanoplis dam in Kansas. J. F. Shea is associated with past work on the Delaware Aqueduct, New York, and on a California army cantonment. Winston Brothers have been active for years with Missouri Pacific Railroad earthwork. Ford Twaits is former president of the Consolidated Rock Products Co., Los Angeles, Calif., and has done considerable building construction.

In order to get the most out of their new shovels, extensive preparatory work was done. This included the construction of a well-planned system of haul roads and the erection of grizzlies for screening the river run material.

The bulk of Santa Fé dam will be built in several zones of this river run gravel. Grizzlies were set up to separate the material coming from the power shovels into two sizes. The larger size is called "plus six," which means larger than 6 in. The smaller, or "minus six" size, will pass through a 6-in. grizzley. It includes everything from sand and dirt up to 6-in. rocks, and is therefore more adapted for use in zones nearer the center of the dam. A clay core, built with clay hauled five miles, is placed on the centerline of the dam with the gravel zoned in gradually increasing sizes toward the outside edge.

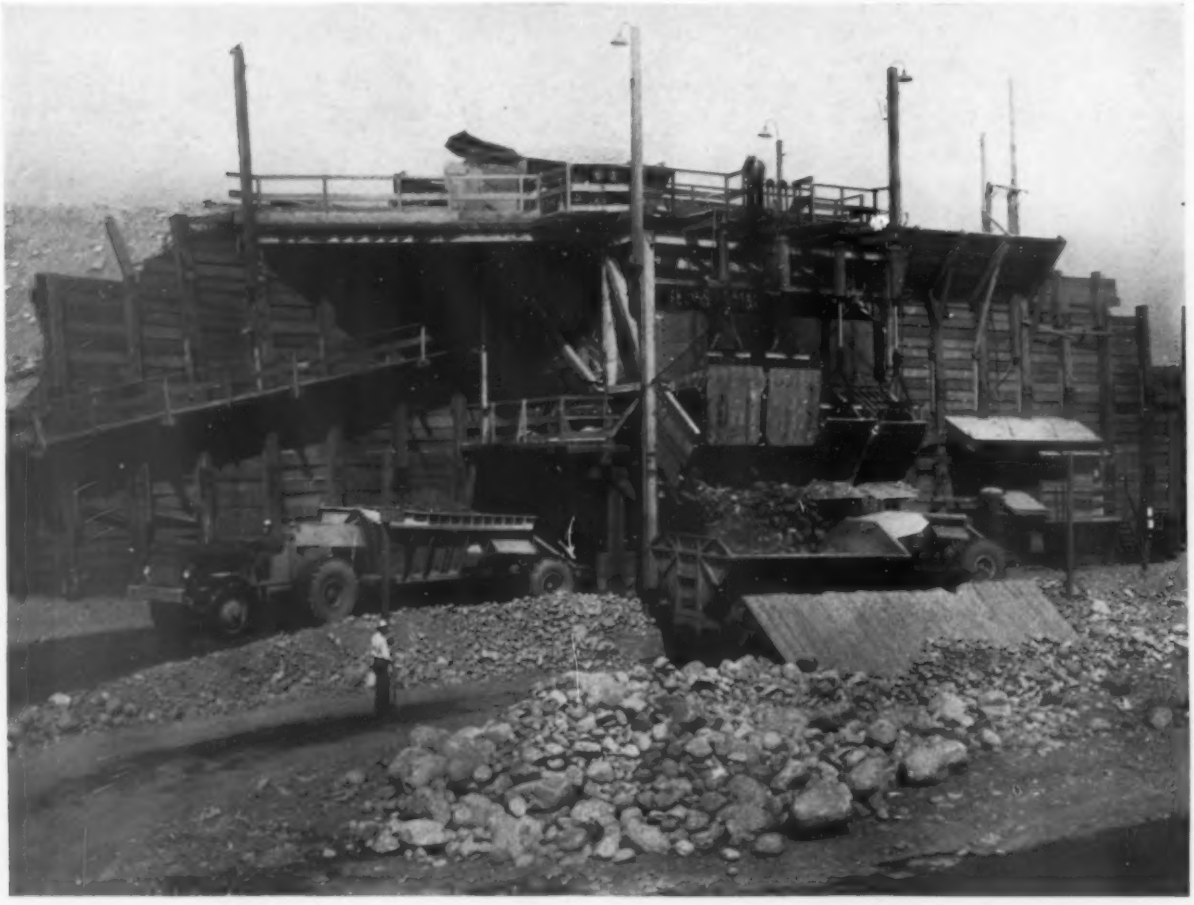
Setup for 2000 Cu. Yd. Per Hour

Under the present system a highly efficient earth moving program is accounting for an output of 2000 cu. yd. per working hour. The first excavation was done in the future outlet channel. The larger machine, a Marion Type 4161 carrying a 5-yd. dipper, is spotted at the upper end. Working about 400 ft. farther downstream is the Marion Type 4121 machine, which digs a pilot cut ahead of the larger unit. The Type 4161 is therefore in the "cleanup" or heavy excavation position.

Both machines are powered by electricity. The smooth, quiet, flexible power of electricity is better demonstrated, perhaps, in the larger shovel. The upward movement of the heavy manganese-lipped dipper through a hard, well consolidated 16-ft. bank is a study in grace and power. The Type 4161 machine, with 100,000 lb. of bail pull available in 3-part preformed wire rope hoist line, is swinging 90 deg. to port from the digging position before the dipper trip spills 5 cu. yd. into one of 11 Maxi 6-wheel 20-cu. yd. side-dump trucks. The adequate power available in the Type 4161 machine guarantees a heaped dipper each swing. Four passes fill up a Maxi truck. Each swing takes about 40 seconds. This means that the Marion Type 4161 produces 720 swings, or 3600 cu. yd. in 8 hours.

The Marion shovels both have an unusually "live," long-lasting roller circle. The upper frame is practically mounted on roller bearings, for this roller circle consists of 36 hardened steel rollers enclosed in an inner and outer ring for permanent alignment.

Excavated material is hauled over one of the job roads to one of sev-



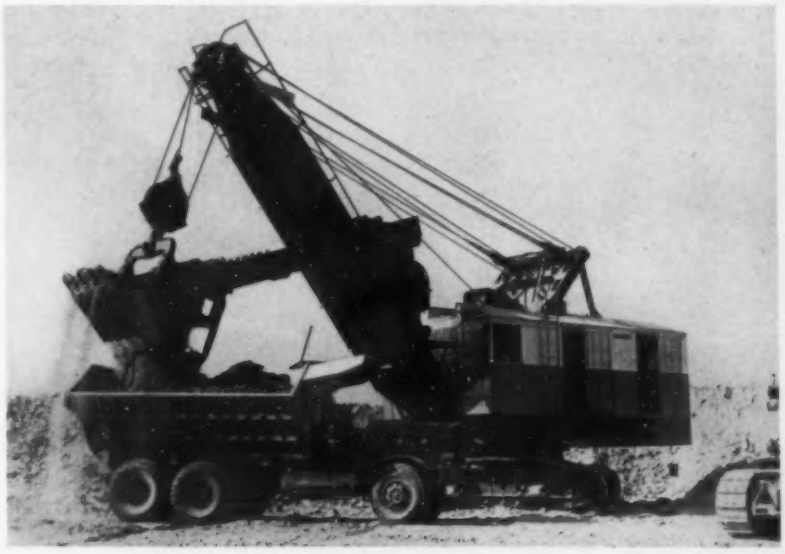
Side dump truck dumping material into hopper type grizzly. Note fine material in the loaded truck, left, and boulders at the right

Left: One of two air-operated, remote control gates, loading truck. There is one operator for three loading points. Load 18 cu. yd. in six seconds. Right: Close-up of 72-in. feeder, having a maximum capacity of 1500 cu. yd. per hour

Close-up of plant where material is sorted into three sizes before being transported to the fill

eral grizzlies. The Maxi trucks pull up straight and dump directly into a Stephens-Adamson 72-in. feeder. This machine shakes and feeds the material to a 60-in. rubber conveyor belt driven at rapid speed by a 200-h.p. General Electric motor. The journey from the feeder up to the top end is some 275 ft. The material falls down through two heavy-duty stationary bar screens set at a 20 deg. angle, which separate it into plus six or minus six, diverting it into storage.

Three storage bins are used to store and discharge minus 6-in. fill material, while two bins are used to hold the larger boulders. The bins set up over a haul road and discharge into Maxi 12 cu. yd. end-dump trucks by means of hydraulically-operated slide gates. Fill material thus loaded is dumped in a thin layer on the dam. Smaller sizes, including minus six, the transition zone, and particularly the impervious clay core, are carefully treated with water and tamped with heavy sheepsfoot rollers. When soil is thus placed, with approximately 15 percent of moisture by weight thoroughly mixed in, it compresses readily and sticks in a mass when a handful of it is picked up and squeezed. At that stage it barely picks up at the back end of the roller. To place it wetter not only results in a weaker fill but sticks trucks as well, while less moisture also results in a lighter, weaker fill. With the water content right, it is not uncommon to tamp 135 lb. of clay into a cubic foot.



Loading one of the eleven 6-wheel 20-cu. yd. side dump trucks

Continuous operation is assured, according to the project engineer, who is quoted as follows: "We've got shifts of mechanics staggered to cover a 24-hour day. We've even installed the best preformed wire rope that money can buy on all our cable-operated machines, such as bulldozers and those Marion shovels at the head of our production line. Preformed wire rope gives us about 30 percent longer service, we figure, which means that on a job like this the machines are down for control rope changes fewer times. It doesn't even take our men as long to install preformed rope because it handles easier. Add to that example the fact that we keep all common spare parts in stock ready for use, and bear in mind that portable truck-mounted grease rigs service the machines right on the job and you see why we haven't had any breakdowns important enough to affect the fill for long periods of time."

On-the-job officials include Project Manager R. F. Rasey, Project Engineer C. S. Bradley, General Superintendent A. H. Johnson, Master Mechanic Marc Smith, Excavation Superintendent George Haensel and Equipment Superintendent C. C. Gail.

HAULAGE

Saving Motor Truck Maintenance

Loaded trucks hauled up incline at Cedar Bluff Quarry by means of "barney" car

By BROR NORDBERG

PRODUCTION of the Cedar Bluff Quarry, Princeton, Ky., has increased 25 percent since quarry trucks were substituted for cable-drawn cars early in 1941. The plant had an hourly capacity of 175 tons which could not be realized in full with the cable-car haulage equipment.

Trucks were desired for their flexibility in the limestone mine from which the bulk of the stone is excavated and in a quarry alongside where stone is taken out for agricultural limestone. The flexibility of trucks, in and around the excavations is being realized even though the mine and quarry require the negotiation of a 22.2 percent grade for a length of 700 ft. to the crushing plant.

Overall view of crushing plant. Stone from the mine comes into plant on the other side

A system of transportation was adopted along the lines of the haulage used by the New York Trap Rock Corp., at Verplanck, N. Y., where semi-trailer trucks are cable-drawn up an incline to the crusher. The principal differences are that the Cedar Bluff quarry has a stiffer grade to negotiate and smaller trucks are used because of space limitations inside the mine.

There are five 95-hp. Ford trucks, with dual rear wheels and Hercules Steel Products Corp. end-dump bodies. They are loaded by two 20-B Bucyrus-Erie electric shovels with ¾-cu. yd. dippers. Each truck has extra heavy springs, a reinforced frame and a 36-in. tail gate. They haul six tons and have 7.50 and 8.25 pneumatic lug tires on the front and rear wheels, respectively.

They travel on their own power inside the mine and in the quarry where their maneuverability is needed, and are pulled up at the foot of the incline where the cable begins to operate. On the end of the cable is a "Barney" car, traveling on 20-in. gauge track up the incline. This is the means of quickly engaging and pulling the trucks up the hill.

Left: Truck returning from crushing plant. Note "barney" car on track ready to pull up load. Right: Action "shot" of truck with six tons of stone being pulled up 22.2 percent grade by "barney" car

Open quarrying operations at Cedar Bluff quarry, showing electric shovel loading truck. The face is 38-ft. high

A truck pulls over a pit at the foot of the incline, and the "Barney" car is pulled out by the cable which engages it against a plate on the back of the main frame of the truck. The car is pulled by ¾-in cable off a single-drum hoist driven by two 85-hp. electric motors, at the rate of 10 m.p.h. with the truck engine in neutral. At the head of the incline, the truck pulls away from the "Barney" car and is driven on its own power to the crusher. In the meanwhile the car has returned to the bottom of the incline for the next truck while the empty one is driven down a 20-ft. roadway alongside the cable. The system easily handles 30 loaded trucks per hour.

The pulling car operates on roller bearings and is loaded with lead. It weighs 3350 lb. and returns to the foot of the incline by gravity.

W. C. Sparks is owner and general manager of Cedar Bluff Quarry and I. T. Sholar is superintendent.

Gravel Plant Burns

Umpqua River Navigation Co., Reedport, Ore., had a gravel plant destroyed by fire, with $15,000 damage to machinery. An oil tank exploded.

Batching

(Continued from page 45)

standard type with compartments for fine and coarse aggregate. Cement is received separately from a nearby batcher. Loads are delivered to paver type mixers for airport runways or to Mixermobile units or other mixers for buildings.

Cement is received in bulk in box cars on a separate railroad siding built on fill. The box cars have bulkheads of timber at right angles to the freight car door opening, forming a well with cement on each side. Cement is moved out of the car by a plow or drag operated by cable to an automatically controlled Weller Manufacturing Co. hoist which stops the plow at the lip of the hopper of a chute leading to a short Link-Belt screw conveyor which moves the cement to the boot of a Link-Belt bucket elevator that carries it to the hopper above a Blaw-Knox weigh batcher. A Hercules gas engine drives the screw conveyor and bucket elevator. There are two cement batching plants, each of 300-bbl. capacity.

Officers of the Union Sand and Gravel Co., Spokane, Wash., are H. D. Sullivan, president and purchasing agent; W. M. Murphy, vice-president; J. W. Murphy, secretary-treasurer.

Tennessee Phosphate News

For the first half of 1942, shipments of phosphate rock from the Tennessee field into all consuming channels have been greater than in any similar period since production started in 1896. While definite figures are not yet obtainable, the total consumption at electric furnace plants at Columbia, Mt. Pleasant, and Muscle Shoals, together with shipments to other parts of the country, have averaged well above the staggering figure of 100,000 tons per month.

Effective June 12, 1942, it was decided by the committee in charge of application of Ex Parte ruling No. 138, I.C.C., that while the increase of 3 percent would stand on all freight rates on phosphate rock in bulk, the rates on phosphate rock in bags would be increased 6 percent. It has been charged that this rate increase discriminates against the farmer who buys his rock phosphate in bags to facilitate handling.

MOVING CEMENT INTO STORAGE WITH AIR

Efficient material handling system at Pioneer Sand and Gravel Co. plant in Seattle, Wash., increases capacity

SEVERAL IMPROVEMENTS have been made at what is known as the Spokane Street central premix plant of the Pioneer Sand and Gravel Co., in Seattle, Wash., to speed up the handling of the bulk cement from box cars and the movement of aggregates to the mixers. All concrete is premixed and the transit mixer trucks are merely used as agitators. In addition to this plant, there are also two other plants. Total capacity is 100 cu. yd. of concrete per hour.

To eliminate a dust nuisance and obtain a more efficient handling of bulk cement, the company installed at its Spokane Street plant a 6-in., type C, 40-hp., Fuller-Kinyon remote-control cement unloader and a Fuller single-stage rotary compressor to operate it. This unit has a capacity of 125 bbl. an hour or approximately two hours to unload a car of cement including preparation time, etc. The illustrations show the Fuller-Kinyon unloader in action.

A flexible hose line carries the cement under air pressure to a permanent steel pipe underground to the mixer plant, about 60 ft., and then rises vertically above ground to two steel tanks, each with a capacity of 750 bbl. Each bin has the Fuller bin level controls.

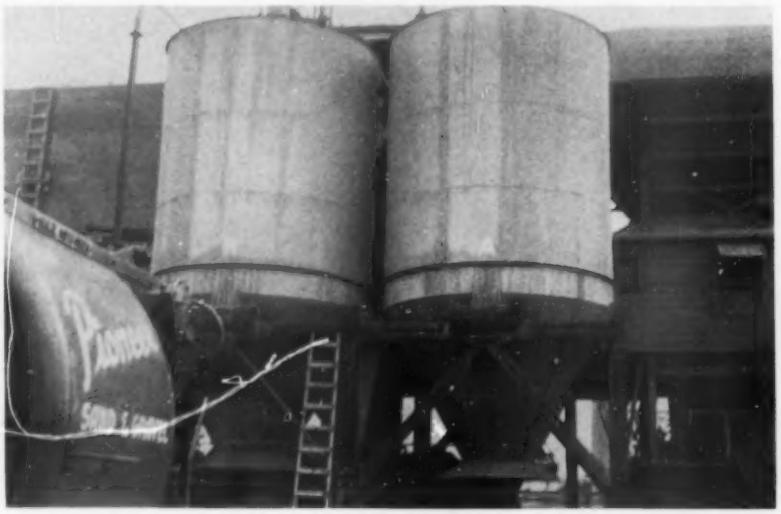
Cement is taken from the bottoms of the two storage tanks by a cross screw conveyor which feeds another screw conveyor dumping into the boot of a short enclosed bucket conveyor. The bucket conveyor elevates the cement to an 18-bbl. capacity surge tank from which short screw conveyors take the cement to weigh hoppers over the concrete mixers. This 18-bbl. surge tank also has Fuller bin control apparatus to automatically shut down the conveying system when the bins are full and start it up when a pre-determined low level is reached.

Large capacity hoppers above the 2-cu. yd. Rex type 56 concrete mixers hold the aggregates which are filled by cranes from stockpiles of material received by barge. The Spokane Street plant has a capacity of about

(Continued on page 77)

Pneumatic car unloader which unloads bulk cement from box car at the rate of 125 bbl. an hour. Note how operator controls movement with Mercoid switch

Two silos which receive bulk cement from box cars by means of pneumatic car unloader.



Practical Operation Conveyor Belt

Part 5: Records: Costs of conveyor belts installed; how to economize on replacements

By MELVIN C. DOW* and HARVEY A. HARNDEN†

MOST OPERATORS keep a record showing the service received from their conveyor belts, and it is highly desirable to do so, for these records can be used not only as a basis for future replacements but will also show how improvements can be made, resulting in further economies. These records may be kept in a simple note book or what is more customary on the special forms for the purpose printed and distributed by most belt manufacturers. Such forms often include both data concerning the conveyor machinery and the belt itself on the same sheet. Sometimes the conveyor record is on one side of the card or sheet and the belt service record on the opposite side. Although the arrangement of the data is not of extreme importance we have found that it is preferable to keep a separate record of each belt's history on its own sheet.

With records kept in such a manner, it is possible to send a copy of the conveyor data to a belt manufacturer and get his independent recommendation for a future replacement belt for the conveyor. It is also possible to transfer belt records to other conveyors when belts are transferred. These recommendations when coupled with past belt service records make it possible for the operator to be reasonably certain that he is buying the proper belt for the job.

An actual typical record taken from our files is shown in Fig. 2 and the record for one belt used on this conveyor is shown in Fig. 3. The forms themselves are printed on a good grade bond paper and are filed in a ring binder for ready reference. Any calculations or correspondence concerning the conveyor is filed along with the belt records.

How to Obtain Data

Turning our attention to the conveyor record for a moment, it might be well to explain how some of the data were obtained. When we wish to measure the length of a conveyor belt that is already installed, we pick some time when the conveyor is not in use and first note the position of the take-up and the possible travel already used. Some of this distance should be subtracted from the measured belt length to obtain the butt to butt length of a new belt. We then start the conveyor and run it until a splice appears at some convenient starting point. This point is marked as such with lumber crayon.

A steel tape is laid on the belt starting from this point and the 100 ft. point is marked as such. Then the belt is started and run until the marked 100 ft. point is at the first point. Then another tape length is laid off and marked 200 ft. and so on until the total length is obtained. All this may seem rather obvious, but it is a very accurate method of measuring a belt. By this method we have been able to check the length of several belts in a very short time. Now, at some future time when the belt is normally loaded, observe the time for several complete cycles of the belt. The actual butt to butt length divided by the time in minutes of one complete cycle of the belt will give you the exact belt speed, more accurate than a speed indicator would show, because any slip is already compensated for.

The exact belt speed is also useful in obtaining the capacity of the belt. If the belt is uniformly loaded, and if it can be stopped under load, the method of taking a "cut" of the load can be very accurate. In this method, so well known as to scarcely need comment, the tons per hour carried equals the product of the belt speed in feet per minute, times the load in pounds per foot of belt, times 0.03.

For weighing the "cut" or sample from a selected length of belt we have found a portable scale outfit consisting of a spring scale and tripod to be very convenient. In taking the "cut" we usually remove all the material between two or three troughing idlers, depending upon the size and character of the load. To be certain of getting only the material between the points selected we slip a piece of light gage iron curved roughly to fit the contour of the belt through the load perpendicular to the belt at one point and then carefully clean off the belt to this sheet. Then the sheet is pushed through the load at the other end of the selected distance and the remaining portion cleaned off. All this can be done in less time than it takes to describe it.

The power is obtained from test meter readings of the motor, and in using these data to determine belt stresses the efficiency of the motor and drive should be considered.

Belt Record

In the belt record it is necessary to give enough data to properly identify a belt so that an accurate analysis of the service can later be made. The brand name is a convenient means of identification, but this must be supplemented with the specification giving the number of plies, the weight of the duck, the cover thicknesses, the tensile strength of the covers, and the friction between plies. On the record it is also interesting to note the length of time elapsed from when a belt is received at the plant to the date when it is put in service. If belts are not properly stored for any length of time the expected service is materially reduced, although the writers know of belts which have been kept as "spares" for several years with no apparent loss of quality.

The tonnage or yardage carried by a belt is the most necessary factor to determine in order to calculate the unit cost of the belt. For conveyors which handle all of the input to the plant, all of the shipments from the plant, or for conveyors which are equipped with integrating scales this is an easy matter. The load on the majority of conveyors, however, is not so easily determined and it becomes necessary to devise some fairly easy system to estimate tonnages.

(Continued on pages 54, 55 and 80)

*Chief engineer, New York Trap Rock Corp., Newburgh, N. Y.
†Formerly with Engineering Department, New York Trap Rock Corp.

FORM E126-1500-9-32

Summary sheet 4

— BELT RECORD —

PLANT No. 3

BELT No. CONV. 13B3 TRANS. ____ ELEV. ____

ORDER No. 38663 VENDOR X BRAND X PRICE PER FT. 8.09 TOTAL BELT COST $3746.

LENGTH	WIDTH	PLIES	DUCK	OUR GRADE: COVERS	OUR GRADE: FRICTION	COVER THICKNESS: TOP	COVER THICKNESS: BACK	STITCHED	DATE: REC.	DATE: APPLIED	DATE: REMOVED	SERVICE: CU. YDS.	SERVICE: OR. DAYS OR HRS.	COST: CU. YD.	COST: PER HR.
463	42	7	36 oz	#2	#2	1/4	1/16	Breaker strip inc. in Top	3/29	3/1/29	5/2/33	5,224,093		.000717	

Summary REPAIRS INC. TAKE-UP, COVER PATCHING, PIECING, ETC. For details of repairs see sheets 1-3.

DATE	CAUSE	NATURE	COSTS: MAT.	COSTS: LABOR	COSTS: TOTAL	PRODUCTION HOURS LOST	REMARKS
9/10/32	Accident - chute plugged.	Ripped carcass	3.12	.90	4.02	0	Repaired with belt hooks
'32-'33	Overstress - ply separation	Joints pulled apart	71.80	27.90	99.70	0	New joints necessary
"	Carcass & cover wear	weak spots.	1426.24	37.35	1463.59	0	Patched with new and used belt.
					1567.31		

GENERAL REMARKS AND SUGGESTIONS (BASED UPON OBSERVATION OF BELT IN SERVICE AND ITS CONDITION AFTER REMOVAL) WARRANTING CHANGES IN BELT SPECIFICATIONS OR MACHINERY THAT WILL EFFECT MORE ECONOMICAL OPERATION

	CONDITION	RECOMMENDATIONS
BELT CARCAS	Very bad. Ply separation general except in replaced portions. Rotten spots noticed.	Overstress with small pulleys apparent cause failure. Recommend 7 ply 42 oz in replacement
BELT COVERS	Good considering carcass. Complete failure only at worst carcass conditions	Recommend 3/16" cover but of best quality. #1 Specification. Old cover failure apparently not caused by pure wear.
MACHINERY	Good - in general - head pulleys too small - guide idlers necessary.	If pulley replacements are ever necessary consider larger diam. if possible to install. Replace guide idlers with training idlers. Check for skirt board wear.

COST SUMMARY

BELT	3746.00
REPAIRS	1467.61
FASTENERS	99.70
DRESSING	
MISC.	
TOTAL	5,313.31
COST PER 1000 CU. YARDS	$1.02
PER HR.	

FORM E125-1500-8-38

CONVEYOR BELT NO. 13B3 PLANT No. 3 LOCATION Second. Crusher to Rev. Scr.

WIDTH 42" SPEED 367 FT./MIN.

LENGTH
- CENT. TO CENT. 213'
- BUTT TO BUTT
- ADD FOR SPLICE
- LENG. TO ORDER 463'

(Check length before re-ordering belt)

RISE IN FEET 68'-0"

ANGLE OF INCLINE 18°-12'-54"

MATERIAL
- SIZE 3" MAX. dust MIN.
- WET OR DRY dry
- WT. PER CU. FT. 100# ab.

TYPE OF DRIVE
- SINGLE PULLEY
- DUAL TANDEM
- GEAR TANDEM ✓ 96T. 2" D.P.
- DIRECT. RED'R ✓ thru extended shaft
- CHAIN
- BELT

CAPACITY (TONS/HR.)
- THEORETICAL 1140
- TEST MAX. 1150
- " AVER. 725

POWER (H. P.)
- THEORETICAL 111
- TEST MAX. 112
- " AVER. 85

MOTOR
- SPEED R.P.M. 585
- H.P. RATED 150
- VOLTAGE 2200
- FRAME NO. See orders 35984 26267

REDUCTION METHOD
- RED. NO. No. 11DA Falk
- RATIO 15.7 ÷ 1
- H.S. COUP. No. 14C
- L.S. " No. R.W. 35699
- BASE No 1189
- RED. SPROCKET none
- HEAD PULLEY " "
- CHAIN NO. "
- GEARS "

TAKE UP
- TYPE Vert. gravity
- TRAVEL 10' ±

HOLD BACK GE solenoid

BRUSH scraper

TRIPPER no.

LOADING POINTS 2 tail - 1 center

LOADING CONDITIONS
- GOOD
- FAIR ✓
- BAD

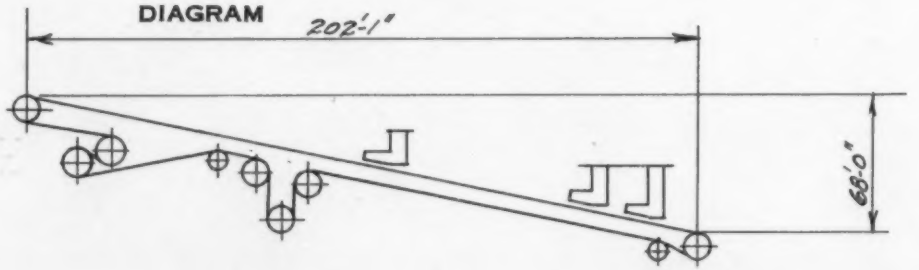
PULLEYS 44" Face

No.	Location	Size	Lagg. / Bare	Ref. Dwg.
1	HEAD	30 x 5 7/16		below
2	DRIVE	36 x 5 7/16	✓ Lagg.	
1	TAIL	30 x 3 15/16		
1	TAKE-UP	30 x 3 15/16		
2	" " BEND	30 x 3 15/16		
	SNUB			
2	BEND	20 x 3 7/16		
	BEND			

IDLERS

	No.	Type	Spacing
TROUGHING	58	Robt. 903X	3'-9"
RETURNS	17	" plain brg.	8' about
GUIDE	3	" "	30' " (on return)

DIAGRAM



REMARKS

Orig. conv. 36" installed in 1925 on contract 1157. Changed to 42" in 1927 and tandem drive replaced single pulley contract 1200. Speed reducer and larger motor added Aug. 1928 on Work Order 3-11. Vertical gravity take-up replaced 36" screw type in Mar. 1929. on Work Order 3-17

NOTE: IF HEAD PULLEY IS BELT DRIVEN SEE TRANS. BELT RECORD NO.

REFERENCE DWGS. FOR CONVEYOR Contract 1157 dwg 29 - Contract 1200 dwg. No1. - Work Order 3-11 sheet 1 - Work Order 3-17 sheet 1.

Particle Size Distribution

Sedimentation methods for quick determination of the size distribution of finely pulverized materials

By H. E. SCHWEYER*

IN RECENT YEARS there has been developing in the mineral industries and other fields an increasing demand for uniformity of products of small sizes. This demand has necessitated the use of sub-sieve methods for determining the particle size distribution of particles smaller than a No. 325 sieve (nominal aperture of 44 microns) because materials meeting a specification of a certain amount "passing a No. 325 sieve" may show a variety of size distributions in the sub-sieve fractions. These variations may determine whether or not a particular material is suitable for the purpose for which it is intended. It is therefore desirable that the size distribution of the particles smaller than a No. 325 sieve be defined by methods which yield reproducible results and which are practical for controlling manufacturing operations. The pipette, hydrometer and Wagner turbidimeter methods have been found satisfactory for determining particle size distribution down to 1.25 microns.

The most expedient methods for obtaining the size distribution of finely pulverized materials are those based on Stokes law. Such methods use the equivalent sedimentation diameter as a basis rather than absolute size, but the results are related. Furthermore, sedimentation analyses do not require elaborate apparatus and the results may be obtained rapidly. The pipette and hydrometer methods are generally suitable for determining the size distribution of most materials above the colloidal range and below sieve sizes, *i.e.*, between about 0.2 and 75 microns. The results with these methods may be combined with sieve analysis to give a complete delineation of the size distribution from the smallest to the largest sizes using a sedimentation diameter basis. The pipette method may be considered as a calibration method since the determination is based on no assumptions other than the validity of Stokes' law. Its principal use therefore is in the occasional checking of the precision of the hydrometer method where a large number of analyses per day are being made with the latter method. The hydrometer method is also based on Stokes' law, but, in addition, it employs an empirical constant for conversion of the sedimentation data to size distribution. This latter method has been used successfully for materials having a range of density of from 1.75 (coal) to 7.66 (galena) with water as the medium. The hydrometer method is especially suited for control purposes because estimations of size may be made rapidly. For example, for many materials having densities of the order of 2.7 it is possible to obtain the amount finer than 10 microns in about 30 minutes from the start of the sedimentation operation. With the special pipette described later it would require about 15 minutes settling time plus the time to recover the dried

*Columbia University, New York, N. Y.

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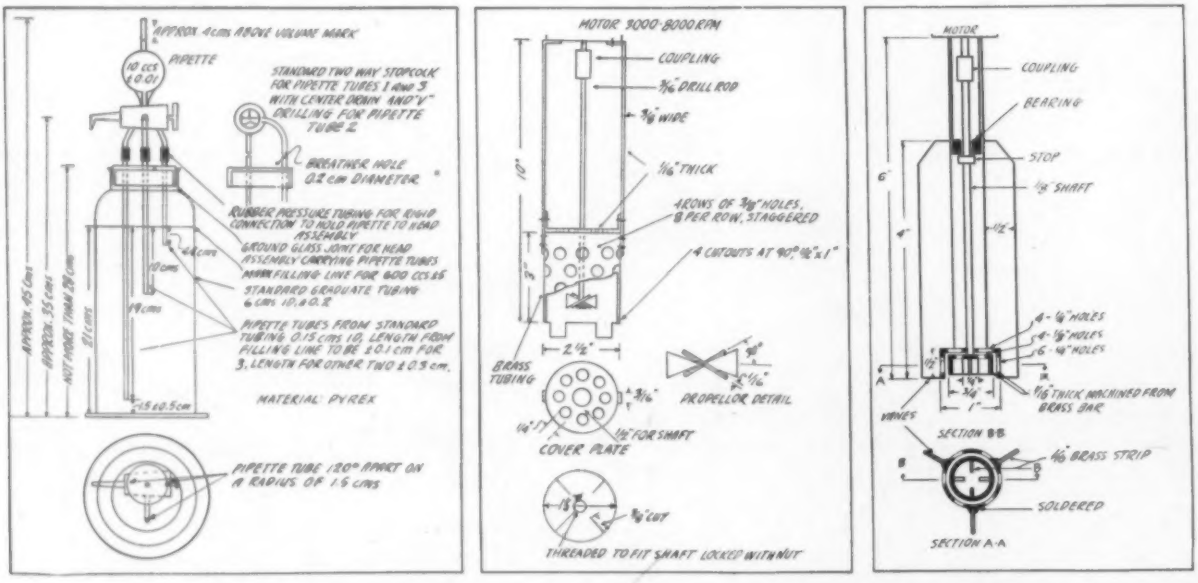

Fig. 1: Pipette for rapid particle size analysis. Fig. 2: Stirring apparatus for coarser particles. Fig. 2-A: Stirring apparatus for very fine materials

Getting the Lime to Run the War

Methods of increasing capacity using a minimum expenditure of money

By VICTOR J. AZBE*

WE ARE NOW getting well into the war, and with the industrial activity speeded to high gear a shortage of lime in some localities is developing. At the same time there is a shortage of steel for new kilns, as also a shortage of labor to operate the plants.

However, by some re-arranging almost all of the existing plants could produce much more lime, and if after that new kilns really become necessary, they can and should be built in a manner to produce the maximum of lime for the minimum of steel and refractory. They should be built to produce the most with the least in both materials and investment. Even though money now is readily available, recklessness with it in any but military matters is less justified than ever. A cold million is not necessary to build a rather good-sized lime plant, and neither is nearly as much steel and special machinery as is ordinarily assumed. That this is so, we have many proofs scattered countrywide.

Before resorting to new construction, the present equipment should be sized up. We find that increased capacity can be secured most readily and economically in existing plants, when, in most cases, it merely means changing of kilns with all attendant equipment already in place.

For most kilns in this country the capacity is small when compared to size; and with it labor and other operating charges are disproportionately high. Such kilns in no way fit into the present picture, and will fit even less into that of tomorrow.

Must Stretch Kiln Capacities

So it seems reasonable that before anything new is contemplated—either new plant or new kiln—both the industry's leaders and the individual plant owner should first scan their territory for possibilities of improvement of existing plants. New kilns are not always necessary and new plants virtually never so, the old should be touched up first for better results before using steel that properly should go into ships, guns or shells. We should stretch kilns as we stretch clothing to enable the construction of items of military necessity. We can afford, in fact we *must* be wasteful with guns, but not with kilns; for when we are wasteful with kilns, we in some measure at least retard the production of offense and defense weapons that will determine our national survival.

But to have ships we must have lime; it seems that to have almost anything we must have lime. And

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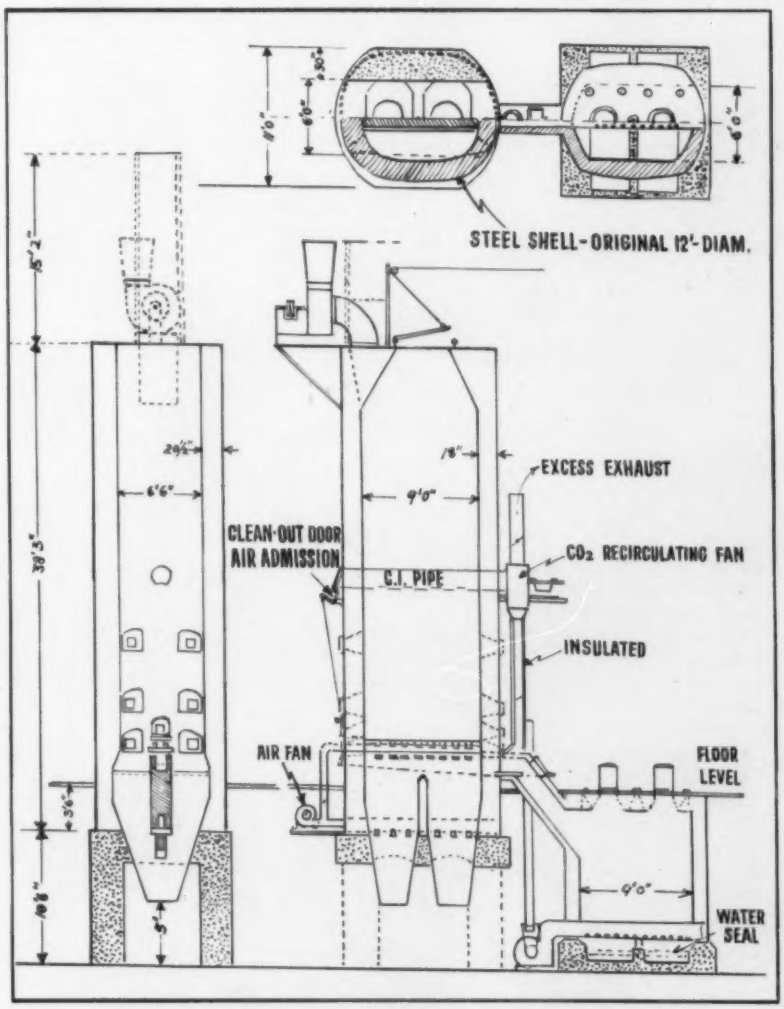


Showing how changes in shaft kiln increased lime production

*Consulting Engineer, St. Louis, Mo.

Controlling Factors For Efficient Rotary Lime Kiln Operation

Proper fuel selection, preparation, method of firing, and loading of kiln with raw materials are essential

By RALPH GIBBS*

OF THE RAW MATERIALS used in a rotary kiln operation, fuel undoubtedly constitutes the largest single item of expense. Consequently the problems involved in the efficient preparation and utilization of the fuel are extremely important, to say nothing of their complexity.

The choice of a suitable fuel must not be made haphazardly. Cost, of course, is the governing factor whether it be direct or indirect. In some instances more costly fuels are used because contamination by the residues of cheaper fuels would be detrimental to the quality of the finished product. When minor contamination is of little consequence, cheaper fuels can be so prepared as to introduce a minimum of contamination. Where contamination of the product is of little or no significance, such as cement or clinkered refractories materials, the poorer grades of fuel can be used even with a minimum of regard for their preparation.

An interesting comparison of the more commonly used fuels is shown in Table I.

The 4,000,000 B.t.u. value in the heading of column C is chosen since this is approximately the sensible and dissociation heat-load required to produce 1 ton of lime at 100% thermal efficiency.

TABLE I

A	B	C	D	E
Fuel	Approx. Heat of Combustion	Approx. Quantity to produce 4,000,000 Btu	Cost Equiv. to Bituminous Coal @ $4.50 at the Plant	Approx. Cost of 4,000,000 Btu
Bit. Coal	13,500 B.t.u./lb.	297 lb.	$4.50/ton	66.8c
Nat. Gas	1,000 B.t.u./cu.ft.	4,000 cu.ft.	.167/cu.ft.	66.8c
Prod. Gas	180 B.t.u./cu.ft.	22,200 cu.ft.	.030/cu.ft.	66.8c
Fuel Oil	20,000 B.t.u./lb.	200 lb.	.023/gal.	66.8c

Column D shows the heat-cost-equivalent of the other fuels as compared with bituminous coal costing $4.50 per ton delivered at the plant. Should it be possible to secure any of these other fuels at a plant-delivered-cost lower than the figure in column D, that fuel having the greatest difference per quantity-unit cost has great possibilities as being the most economical. In most cases, however, bituminous coal is the economic favorite, and only unusual circumstances exclude its use.

Thermal Efficiency

At some time or other, before finishing the subject of fuels, the thermal efficiency of the rotary kiln must be discussed, and it might just as well be here since it has a definite influence on the cost of preparation and use of the fuel.

The rotary kiln is notorious for its thermal inefficiency. Ordinarily the heat losses are tremendous and represents a waste which has been shamefully neglected for many years. This subject of waste-heat and waste-product recovery will be taken up in greater detail in an article to come.

In most plants the fuel costs for the rotary kilns are based upon the cost of the fuel delivered to the plant, and fuel ratio's, both real and imaginary, become the subject of heated discussions. Data and discussions such as these have their value in creating an interest in the study of the problem of efficiently operating rotary kilns, but they by no means tell the entire story. When bituminous coal is used as fuel, it must be prepared properly before it is delivered to the kiln. This preparation requires power and expensive machinery. If oil is used as fuel, steam or air is necessary for atomization, either of which is costly also. If gas is used, blowers or fans require power to drive them, and the more fuel used the more power required. In addition to these higher costs for machinery and power, and over and above the highest cost for the fuel itself, there is that of main-

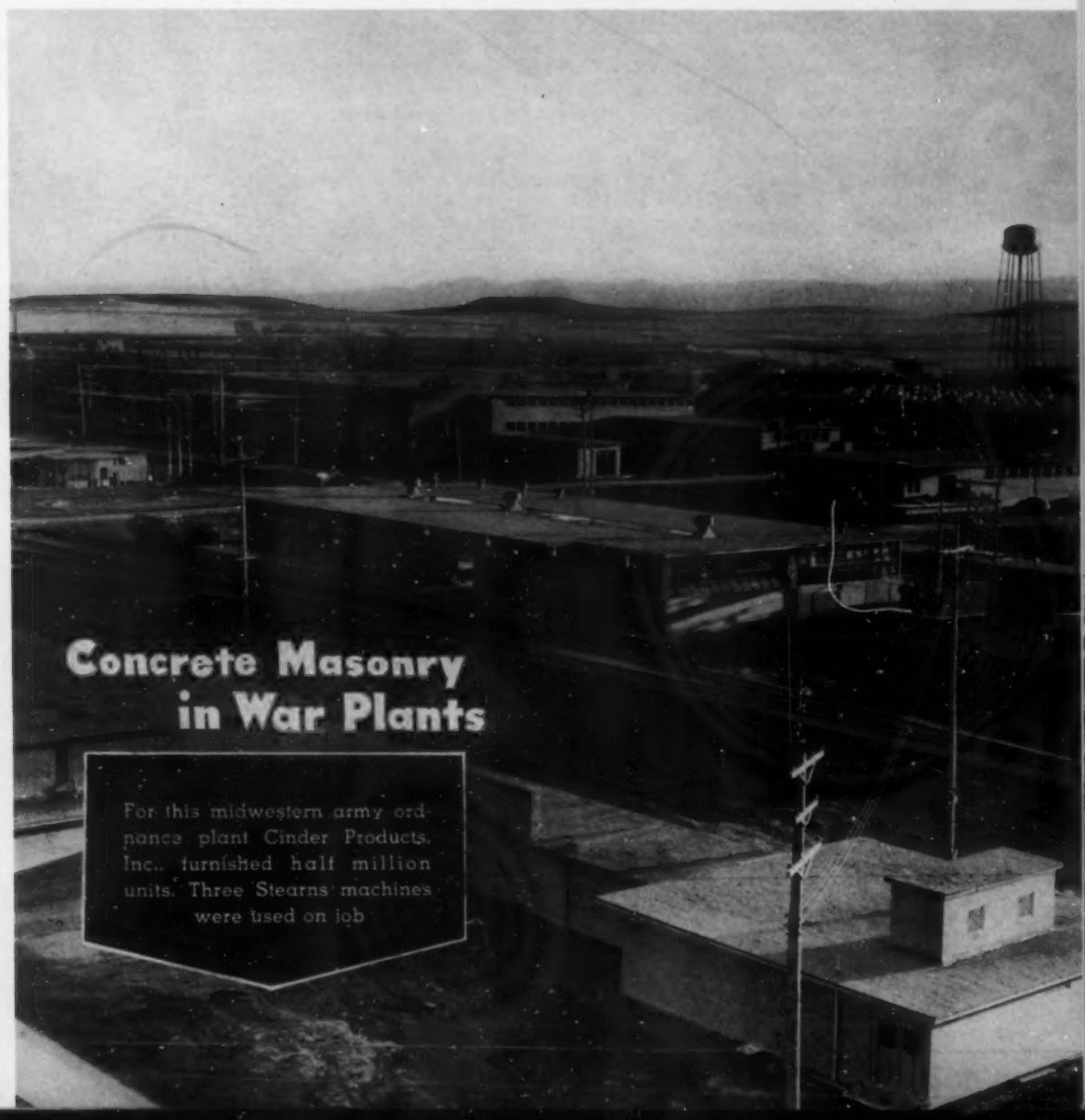
(Continued on page 86)

TABLE II

Fuel Ratio	Lbs. Coal per ton of lime	Btu's fired per ton of lime	Thermal Eff. %
1.67 to 1	1200	16,200,000	24.7
1.82 to 1	1100	14,850,000	27.0
2.00 to 1	1000	13,500,000	29.6
2.22 to 1	900	12,150,000	32.9
2.50 to 1	800	10,800,000	37.0
2.86 to 1	700	9,450,000	42.3
3.33 to 1	600	8,100,000	49.5
4.00 to 1	500	6,750,000	59.3
5.00 to 1	400	5,400,000	74.0
6.67 to 1	300	4,050,000	98.0

*Consulting chemical engineer, York, Penn.

CONCRETE PRODUCTS AND CEMENT PRODUCTS


Concrete Masonry in War Plants
For this midwestern army ordnance plant Cinder Products, Inc., furnished half million units. Three Stearns machines were used on job

Machine-Made Specialties

Union Concrete Pipe Co., Ceredo, W. Va., manufactures pipe principally—diversifies into concrete masonry and develops some new adaptations from pipe

CONCRETE PIPE represents about 80 percent of the production of the Union Concrete Pipe Co., Ceredo, W. Va., but concrete block and miscellaneous concrete products are far more than just sidelines.

The plant where the pipe and other units are manufactured impresses one with its bigness, for a concrete products plant. The centrally-located white silos for materials storage, extensive belt conveyor handling system for aggregates, and yard storage that covers most of the 16 acres of the property have a symmetrical attractiveness that gives the impression of efficiency. Material handling facilities and the entire design are in sharp contrast to the familiar layouts of concrete products plants in general.

Union Concrete Pipe Co. built its first plant in 1925, on the bank of the Ohio River, where the present plant is located. At that time a gravel plant, alongside, furnished the sand and gravel to manufacture concrete pipe. Extensive rebuilding was made necessary by the 1937 flood. All the buildings were tumbled down by the flood, but important equipment had been moved out in anticipation of it. Twenty feet of water stood where the plant is located.

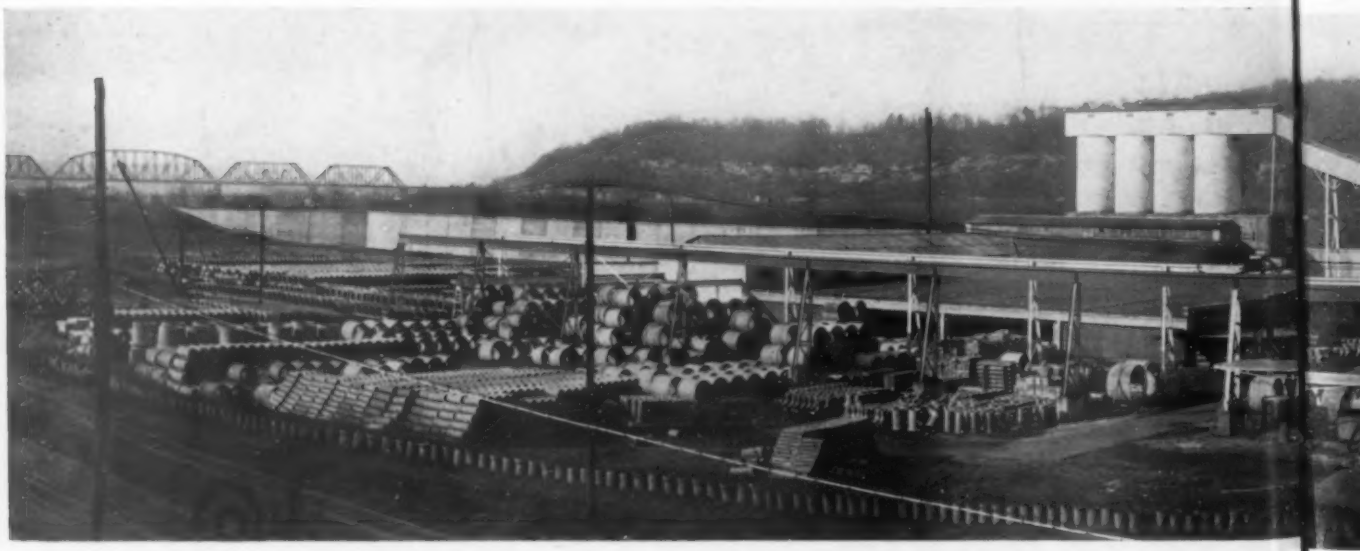
Since the company went into the concrete block business, it has increased its steam curing capacity, built a cinder crushing plant, put in the present materials handling and storage system and begun the manufacture of cast concrete pipe.

Concrete pipe production is about 150 tons of concrete per shift, including 4- to 54-in. machine-made culvert and sewer pipe and 60- to 84-in. cast concrete pipe. Both the tongue-and-groove and the bell-and-spigot variety are made. West Virginia requires bell-end pipe and Ohio and Kentucky favor the tongue-and-groove. Most of the block made are of cinder concrete, 4's, 6's, 8's, and 12's. Capacity, based on the standard 8- x 8- x 16-in. size, is about 3000 daily. Other products are lintels and sills, which are hand-cast; and concrete joists, meter boxes, perforated drainage pipe and semi-circular channel pipe. The last three mentioned are machine-made.

A flood wall was built two years ago and, in exchange for donating right-of-way through its property, the company was permitted to build its plant up to the property line. The wall stands 23 ft. above ground level and serves as the back wall of the plant.

George C. Bowyer, manager, with some specials—perforated drain pipe, channel pipe and water meter box

Aggregates, both the cinders and Ohio river sand and gravel, are stored in four Marietta concrete stave silos, for gravity operation. These silos measure 27½ ft. high, with a 15-ft. diameter, and their bot-



Panorama view of entire plant showing unusual symmetry of layout. Raw materials are stockpiled and processed on extreme right and conveyed into the bins; cast pipe are manufactured in foreground and finished machine-made pipe on left

Truckloads of concrete pipe and concrete block leaving the plant. Other trucks shown are stockpiling clinker and dumping sand into hopper

tom draw gates are 30 ft. above ground level. Together, they would hold 800 tons of sand and gravel which is considerable reserve. Three of them are partitioned in quarters and the other is reserved for concrete sand, thus providing for 13 kinds or sizes of materials.

All these materials are delivered to one end of the plant, either by rail or truck. Sand and gravel are dumped, separately, into a track hopper alongside the cinder crushing plant from hopper-bottomed cars or from trucks. This hopper is placed to serve the main belt conveyor handling sand and gravel into the silos or to receive cinders which are routed through the crushing plant.

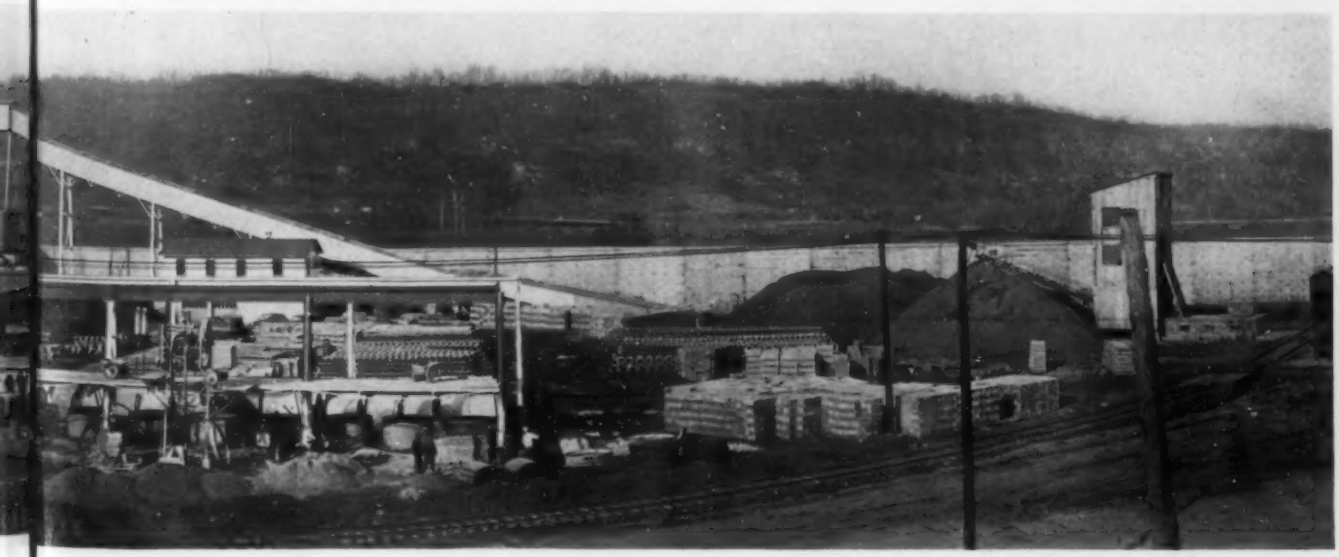
Sand, or gravel, is fed out of the hopper by a No. 4 Jeffrey-Traylor vibrating feeder on to a 16-in. horizontal tunnel belt conveyor, just below ground level, that transfers to an inclined 16-in. belt conveyor for delivery into the overhead silos. Both conveyors, on 245-ft. centers, are equipped with Stephens-Adamson and Link-Belt idlers and Cincinnati rubber belting. A Columbus belt conveyor tripper is the means of filling the different silos. All the available storage of sand and gravel is in these silos.

Processing Cinders

An open stockpile containing several thousand tons of cinders for lightweight concrete block has been built up near the cinder crushing plant. A power plant clinker is considered preferable to the ordinary cinder which would carry considerable fines. Practically all the fines at this plant are a product of crushing a hard clinker. Ageing in open stockpiles is an incidental benefit to keeping a surplus on hand, in weathering out impurities.

A Universal crane handles the cinders directly into the same hopper that receives sand and gravel. Big chunks are broken down on a 6-in. grizzley that covers the hopper. The same feeder transfers the cinders on to a short belt conveyor, with a magnetic head pulley, that feeds into a bucket elevator to an overhead crushing plant.

After passage through 12- x 30-in. Kennedy rolls with replaceable corrugated wearing surfaces, the cinders flow over a 3- x 6-ft. Kennedy single-



Loading an 84-in. concrete pipe with a power crane and sling

deck vibrating screen. Oversize from the screen is re-crushed through 12- x 16-in. New Holland rolls and joins the fines on a swinging, stacking conveyor that stockpiles the sized material over the tunnel conveyor.

Cement is handled in sacks, delivered in carload lots at the other end of the plant and piled within easy reach of the concrete mixers. Sacks are cleaned out by a Wirth bag cleaner. Coal for firing the steam boiler could, and may be, handled over the same system of conveyors which handle the aggregates.

Machine Layout

Although the plant was designed to utilize gravity wherever possible in handling the aggregates into the concrete mixers, the arrangement has not been entirely completed. As set up now, three power machines, two for concrete pipe and the other for concrete block, are in a row and each is served concrete from a separate 30-cu. ft. Besser mixer. The mixers are also in a row, one to each machine, located on a floor level about four feet higher than the main floor.

Underneath the four aggregates silos, which are in a row, are two Butler weigh lorries using Toledo scales, rail-suspended, electrically-operated. Below the silos are two rows of discharge gates, each of which serves one weigh lorry. The operator weighs out the correct proportions of aggregates into the lorry batcher and dumps the batcher into any one of six hoppers on the mixer floor level. Proportioned aggregates are then dumped into the concrete mixers by wheelbarrow. When completed, the mixers and machines will be moved over so that proportioned materials can be dropped right into the mixers.

One of the pipe machines is a Universal Concrete Pipe Machinery Co. unit supplied concrete by a skip bucket. It manufactures 18- to 54-in. pipe. The other is a McCracken Model S that makes 4- to 24-in. sewer pipe and 12- to 24-in. culvert pipe. The feed to this machine is by drag conveyor. Pipe molds are Universal, Quinn, and McCracken. Pipe from the McCracken machine are put into the kilns by two-wheel, rubber-tired buggies, from the Universal machine with two-wheel buggies or an overhead electrically-operated crane.

Block Manufacture

Cinder block and gravel concrete block are made on a skip-fed Besser Victory tamper having a capacity for 8-in. units of 4½ per minute. The machine has an automatic pallet feeder and a chain off-bearing conveyor. Block are handled into the

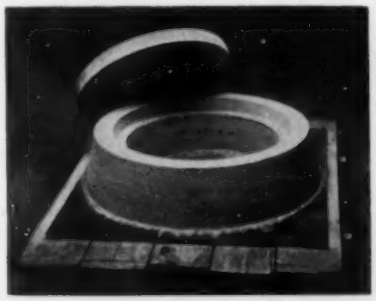
(Continued on page 72)

Casting 60- to 84-in. diameter pipe from an elevated runway. A movable chute is the means of fitting the molds and the concrete is settled by internal vibrators

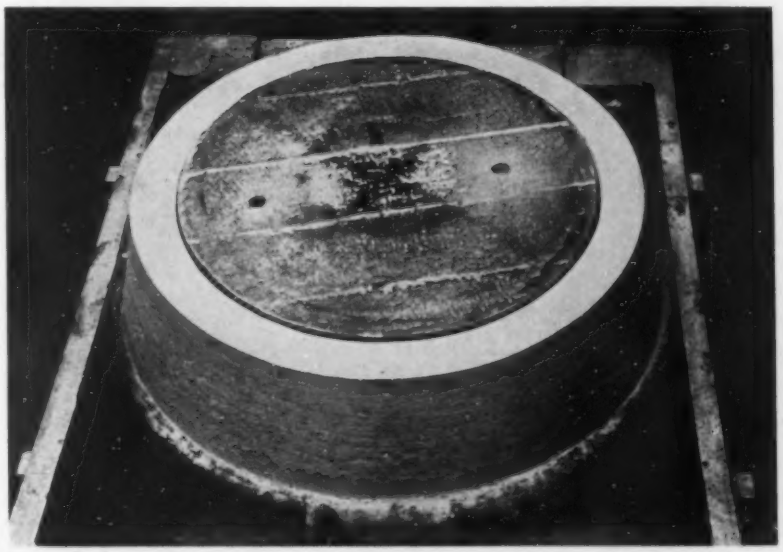
Concrete Manhole Covers

Best Block Co., Milwaukee, Wis., makes covers and frames, also precast ash receptacles

AMONG the special concrete products manufactured by the Best Block Co., Milwaukee, Wis., are manhole covers and frames, which were developed for sewer systems in municipalities and for government projects where sewer systems are required. Recently the company fulfilled its first contract for the new units and manufactured 25 covers and rings for a flying school just outside Milwaukee.



Manhole ring and cover, showing bearing shoulder to support cover



Closeup of manhole frame with cover in place. Note perfect fit and lifting holes which must be provided for in fabricating the molds

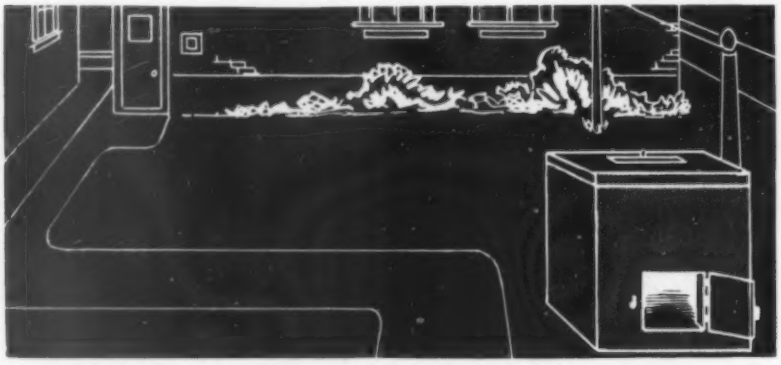
First order, for 25 complete units, on curing racks ready to be loaded onto trucks for delivery to an army flying school

United States Army engineers specified reinforced concrete in place of cast iron even though cast iron might still have been available at the time. The covers were reinforced for a design of 20,000 lb. wheel load plus an impact factor. Compressive strengths had to be a minimum of 5000 p.s.i. in 28 days.

Covers of the kind manufactured for this first contract measure 4 in. in thickness at the center, tapering to 2 in. at the edge of the rim, and are 25 in. in diameter, to have a 1¾-in. bearing all-around on the manhole frame. Reinforcing consists of 12½ lb. of reinforcing rod welded together to make a rigid frame. Lifting holes are provided just as they are for cast iron covers. The frames measure 22 in. inside diameter and 34 in. outside and are 8 in. high. Reinforcing for the frames consists of two circular rings of steel welded together, weighing 6 lb. to a frame. Cast iron covers and rings of the same size would weigh 300 to 400 lb. The concrete covers weigh 95 lb. and the rings 225 lb. Of course, the saving in critical metal is the principal reason for using concrete.

The company is prepared to manufacture concrete covers and frames to standard cast iron sizes, in order to allow their use for replacement purposes if desired, without altering the manhole construction. Metal molds were designed for production casting with the use of vibration equipment. In this plant both the cover and frame are cast right side up.

It was necessary to design a concrete mix that would permit immediate stripping and so that it would have no slump. Standard portland cement or high early strength cement may be used, according to conditions. Aggregates are sand and gravel, with a top size of ⅜ in. and the consistency is about 4 gal. of water to a sack of cement. Capacity is a mini-



Sketch showing how concrete ash receptacle is used by the home-owner, its neatness and convenience for ash removal

mum of 25 complete assemblies a day, based on performance on the first contract filled.

Ash Receptacles

Ash receptacles as manufactured by the Best Block Co. are not a recent development, for this concern, but they represent a kind of product that offers market possibilities even under priority restrictions, since they can be sold for defense housing and for other war projects where there are barracks, etc.

The boxes measure 4- x 3-ft., are 42 in. high, and are cast in one piece, with a separate top. They hold about a cubic yard of ashes, or coal, and are hand-cast, of cinder concrete, in molds. The walls are 4 in. thick. A swivel cover in the top is provided, for filling the receptacle and a door near the bottom for removal. Despite their size, only 9 or 10 lb. of reinforcing steel is required for a complete receptacle.

Insulating properties of the receptacle are an important sales point, since freezing inside the container is reduced to a minimum. In addition they lend neatness to a home, and are durable and fireproof, satisfying all code requirements.

Finished ash receptacle ready for shipment

Sales include placement on a prepared soil base. These boxes have been in service over ten years and their use is recommended by local fire prevention authorities and building inspectors.

Personnel

Walter J. Manhardt, vice-president of the National Concrete Masonry Association, is president of the Best Block Co., which is one of the largest and most efficient concrete products organizations in the country. Capacity is over three million units annually, of Haydite, cinder and plain concrete units. All of its production is going into defense construction.

Others associated with Mr. Manhardt in the company are F. W. Zilisch, A. W. Devos, W. F. Schneider and Walter A. Sherman, all of whom are well known to the concrete masonry industry. Mr. Sherman, consulting engineer, is in charge of promotional and engineering activities.

W.P.B. Urges More Concrete Products

THE WAR PRODUCTION BOARD has urged the nations 3,800 concrete products manufacturers to maintain production to supply these materials as a substitute for lumber.

Only about one-third of the combined capacity of these manufacturers is now being utilized, it was estimated.

Pointing out that it is estimated the supply of lumber will fall about 6 billion board feet short of requirements in the next 12 months, the W.P.B. said that concrete products could be used in place of lumber in numerous instances to alleviate the lumber shortage to a substantial degree.

There are approximately 800 large and 3,000 smaller plants in the United States producing concrete masonry units. The combined annual capacities of all the plants is the equivalent of 1,500,000,000 8 by 8 by 16 inch units.

Cement Dispersing Agent for Paving Concrete

THE MASTER BUILDERS CO., Cleveland, Ohio, has recently placed on the market a cement dispersing and air entraining agent known as HP-7 which, when added to a paving mix, is claimed to improve all the essential qualities of concrete—transverse strength, resistance to wear, freedom from scaling. Furthermore, it appears that this is accomplished with little or no increase in cost, and in some cases with an actual reduction.

HP-7 is essentially a combination of an air-incorporating agent (sodium lauryl sulphate) with a cement-dispersing agent (a derivative of lignin sulphonic acid).

Maximum dispersion of cement in the mix has long been recognized as necessary to the attainment of maximum strength and economy. The introduction of air however, is a newer development which is not so generally known or understood. In fact it is actually contrary to the preconceived ideas of many people. Space does not permit discussion of this subject beyond the statement that small amounts of entrained air permit the use of lower water-cement ratios, reduce bleeding, and appear to add to the durability of the product—especially as regards scaling.

The manufacturer points out that as HP-7 is a mixture of definite compounds in definite proportion, its use is subject to perfect and complete control. It is noted also that while these ingredients can be used separately, and each is effective in its own way, it is only by the combination that the fully beneficial effect is attained.

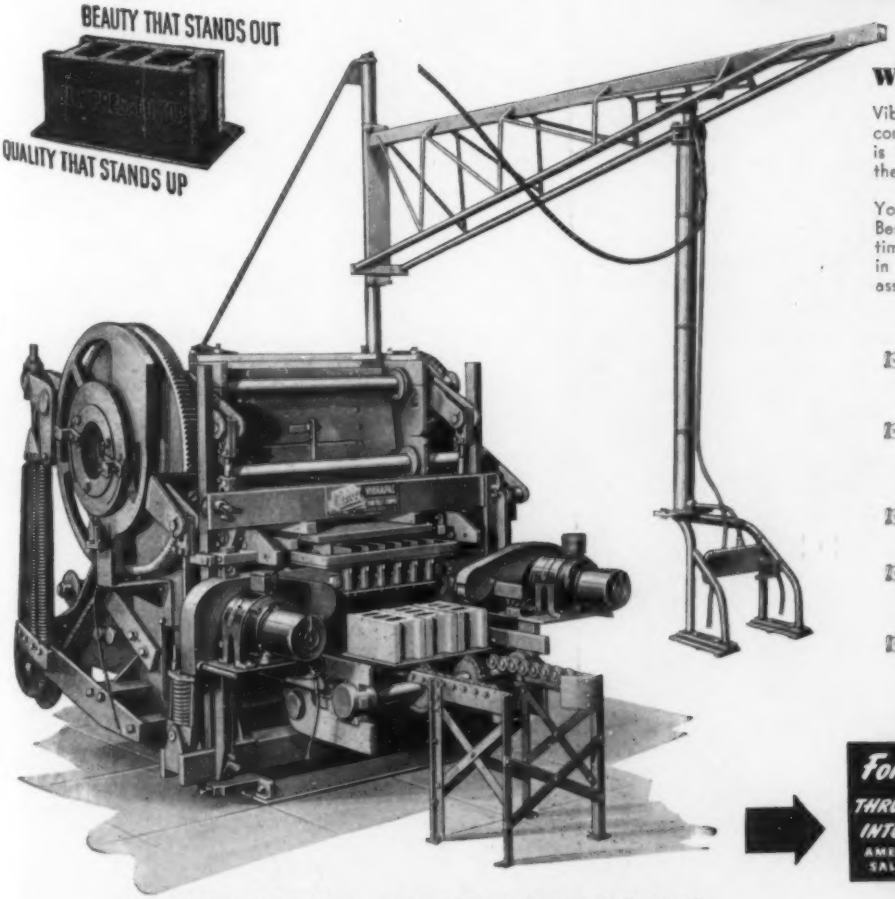
A 24-page pamphlet entitled, "Cement Dispersion and Air Entrainment in Concrete Pavement Construction," by Edward W. Scripture, Jr. Director of the Master Builders Research Laboratories, is available from the manufacturer. It contains a detailed and partly technical account of the character, development and use of HP-7 and of other products intended for the same ends; and includes reports of tests on various ordinary and special concretes at 3, 7 and 28 days.

Wartime Care of Besser Vibrapacs

BESSER PLAIN PALLET STRIPPERS

A Besser Plain Pallet Stripper For Every Need

TAMPERS	Besser Super Automatic	8 Hr. Capacity 3120
	Besser Victory Automatic	8 Hr. Capacity 2160
	Besser Semi-Automatic	8 Hr. Capacity 1680
	Besser Champion, Power Operated	8 Hr. Capacity 1000 to 1200
	Besser Multi-Mold, Hand Operated	8 Hr. Capacity 250 to 350
VIBRATORS	Besser Super Automatic Vibrapac	8 Hr. Capacity 4800
	Besser Victory Automatic Vibrapac	8 Hr. Capacity 2160
	Besser Master Vibrapac, Hand Operated	8 Hr. Capacity 800



Besser Super Automatic Plain Pallet Vibrapac with Mixer and Skip Loader. Capacity 600 8"x8"x16" per hour made 3 at a time on one plain pallet. Smaller units made in larger multiples on the same pallets.

WARTIME CARE OF VIBRAPACS

Vibrapacs everywhere are turning out more and more concrete blocks for war building construction. This is helping to stretch critical building materials farther and facilitate the war effort.

You can help in an important way by keeping your Besser Vibrapacs in the best working condition at all times. This care will pay for itself many times over in longer life and the continuous operation which assures greater production of vital material.

5 IMPORTANT POINTERS

- **(1) CHECK**—Before starting your Besser Vibrapacs on each shift, check machines to make sure they are in perfect operating condition and adjustment.
- **(2) CLEAN**—Mold, cores, feed box, agitator and all parts that come in contact with concrete should be thoroughly cleaned after each shift or before machine is allowed to stand idle for any length of time.
- **(3) TIGHTEN**—Attachment, adjustment and other bolts and nuts should be checked between shifts to make sure all have been properly tightened.
- **(4) LUBRICATE**—Never neglect lubrication. Follow Lubrication Instructions strictly. Any lubrication point neglected means a point exposed to unnecessary wear.
- **(5) PARTS**—New normal wearing parts should be kept on hand to avoid shipping delays. It is good production insurance.

For America!
THROW YOUR SCRAP INTO THE FIGHT!
AMERICAN INDUSTRIES SALVAGE PROGRAM

You, doubtless, are giving attention to all these points, but we urge extra wartime care of all Besser Concrete Block Machinery to minimize delays in operation. Proper care will also reduce factory service demands to a minimum and spare our service staff for any unusual emergencies.

Undirectional vibration under Flam patents (other patents pending) was employed to make the first vibrated blocks ever produced commercially. The Besser Vibrapac combines undirectional vibration with the exclusive Besser Plain Pallet principle. Users of these machines are fully protected under Besser and Flam patents.

BESSER MANUFACTURING CO.

211 Forty-Second St. • Alpena, Mich.

Complete Equipment for Concrete Products Plants

THE SAVING IN PALLET COST WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER

NEW MARKETS

Increases Business by Diversifying

Graystone Concrete Products Co. makes a varied line of concrete products from fish net weights to bridge slabs weighing many tons

By RALPH S. TORGERSON

STARTING IN BUSINESS as a concrete pipe manufacturer exclusively, the Graystone Concrete Products Co., Seattle, Wash., now will undertake to manufacture practically anything in concrete. War demands, however, have made it necessary during recent months to limit its products to those which have relatively high priorities.

Concrete pipe continues to be the main item of production, but the plant produces a line of concrete products, including Dunbrik, septic tanks, manhole block, cribbing, precast piles, joists, guard rail posts, fish net weights, bridge slabs, and various sizes of concrete block. All these products are made with sand and gravel aggregates which are received by barge alongside the rear of the plant. Cement in sacks is received by railroad cars on a siding next to the plant.

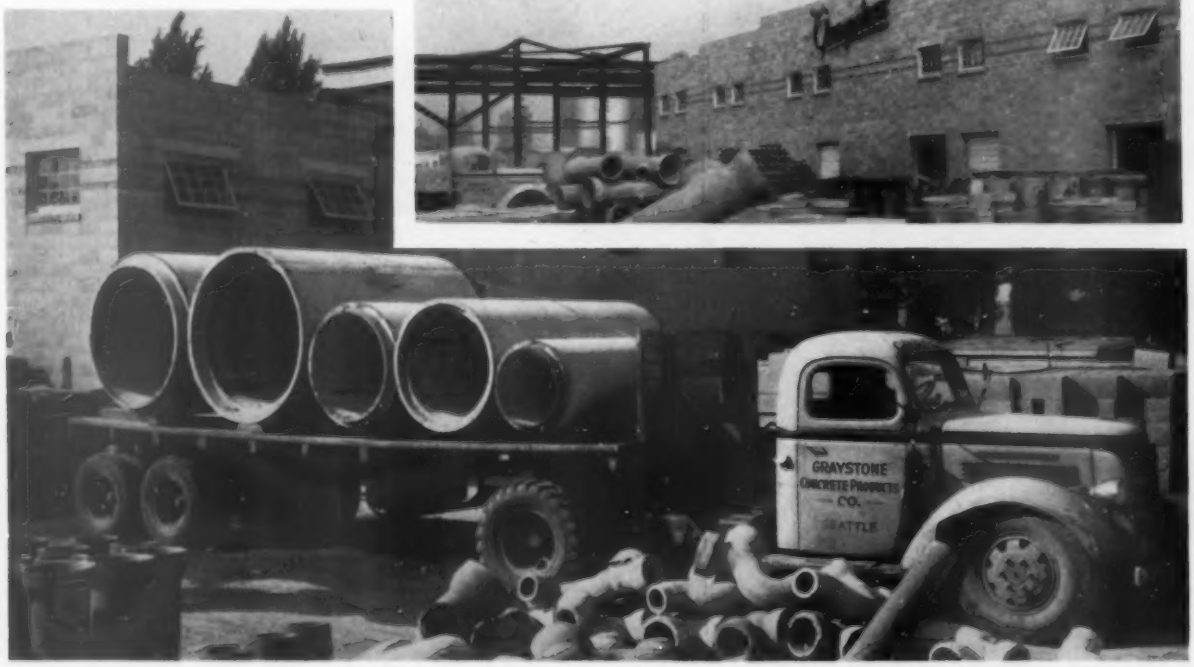
Pipe Manufacture

The pipe manufacturing division includes three tamper type sewer pipe machines, making 3-in. to 30-in. size, and one drain tile machine, a Duntile packerhead type, producing 3-in. to 12-in. size. Larger cast pipe, made in another section of the building, are vibrated in steel forms built by the company. These pipe range in size from 36-in. to 60-in. diameter, and up to 9 ft. in length but most of the cast pipe are standardized at 8 ft. All the cast pipe are reinforced with steel mesh made up to size by three arc welders, one of which is a Hobart type.

At present a vibrating mechanism made and designed by the company is used to vibrate the cast concrete pipe molds. It consists essentially of a small electric motor driven by an off-center weight on a ball-bearing shaft through a short belt, motor and shaft being bolted to an angle-iron frame. This steel frame is in turn bolted to the ribs of the steel pipe forms. A piece of belting serves as a guard over the vibrator to keep out dirt and falling materials. A Syntron vibrator is now used on a

Right: Front view of new section of pipe and block plant. Electric overhead traveling crane, to the left, for moving large pipe

Below: Tractor-trailer combination to haul concrete pipe and block



ABSOLUTELY, YOU CAN MAKE MORE MONEY with JAEGERS

CHARGE FASTER
MIX FASTER
DISCHARGE FASTER

EITHER HIGH DUMP TYPE

Today's concrete production is going to Jaeger Truck Mixers. Agitators as fast as operators can expand their plants: (1) because the concrete industry has proof of the *higher quality* of material produced by the Jaeger Dual-Mix Drum; (2) because opportunities for comparison, on this year's gigantic projects, have proved beyond question that Jaegers, whether HIGH DUMP or Standard LOW CHARGE, can load, mix and discharge faster than any other mixers of their type.

Jaeger, alone, offers this higher payload production with standard 2-Speed Transmission (Separate Engine or Vacuum-Controlled Truck Engine Drive), One-Shot Top Loading, Vacuum-Controlled High Discharge Door, End-to-End Water Sprays and Mixing in Sealed Drums — *in the only line that completely meets every specification and operating demand.*

Combination Top or End Loading with Jaeger Hopper Attachment:

Specially adapted to older or temporary plants not equipped for fast ribbon loading. Permits top or end charging to meet conditions. Only end loader that does not constrict drum opening or require moving Hopper to discharge. Single turn of hand wheel opens Discharge Gate. No second seal to leak or wear.

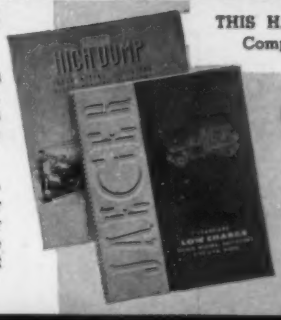
OR LOW CHARGE

A DRUM-FULL — OR A CUPFUL — AT A TIME

JAEGER PORTABLE HOPPER

Saves Truck Mixers Waiting—Means 25% More Payloads per Day on the Average Job.

Tows to job behind truck mixer—takes full 2 or 3 yd. batches. One hopper serves almost any job.



THIS HANDY BLANK BRINGS YOU FULL INFORMATION
Complete Data, Models, Specifications, Prices, Terms

THE JAEGER MACHINE COMPANY
603 Dublin Avenue, Columbus, Ohio

Send us newest information on ☐ Standard LOW CHARGE Truck Mixers, Agitators, ☐ HIGH DUMP Models, ☐ Portable Hoppers, ☐ Auto-Pavers and Spreaders, ☐ Pumps, ☐ Mixers, ☐ Hoists, ☐ Carts.

Name_____

Address_____

UNCLE SAM
"First" AT
JACKSON & CHURCH
You bet . . . Brick Machines and other concrete products equipment are our business—but Uncle Sam has first call on our facilities for the duration. Except for machines carrying high priorities we have side-tracked business as usual.
However, we can help out with used equipment and repair parts; if you need them, call on us.
When peace comes, J & C will again be ready to serve the industry with a complete line of brick and block machines and handling equipment.
JACKSON & CHURCH COMPANY
SAGINAW, MICH., U. S. A.

We're Over 90% WAR PRODUCTION
. . . Yet
High Priorities
Plus MULTIPLEX
Service Still
Assure Proper
Upkeep of Your
MULTIPLEX
Concrete Machinery
SURE — We're doing everything in our power on straight U. S. War Production.
But . . .
Uncle Sam has provided you with good priorities to enable you to keep your MULTIPLEX machines in good running order.
Even though we are "busy as can be" on war production orders, we are also ready to furnish necessary repairs and replacements on these priorities to keep your MULTIPLEX "ship-shape."
Write or wire us if you need our assistance.
MULTIPLEX CONCRETE MACHINERY
ELMORE, OHIO

MANY FEATURES OF MERIT IN FAVOR OF "COMMERCIAL" PALLETS

PERMANENT EQUIPMENT—WE DO NOT KNOW OF A PRESTEEL PALLET CUSTOMER REPLACING WITH ANY OTHER TYPE.

LIGHT AND EASY TO HANDLE AND STORE.

MAKES A FIRM ANVIL FOR TAMPING—PRESSED COLD IN DIES—UNIFORM—RECOMMENDED BY BLOCK MACHINE MAKERS—ASK US OR YOUR MACHINE MAKER.

MANY DIFFERENT STYLES AVAILABLE.

The COMMERCIAL SHEARING & STAMPING COMPANY
YOUNGSTOWN, OHIO.

★

You have to look to ROCK PRODUCTS for Leadership in the Industry

★

Left: Close-up of one of the concrete pipe machines, showing how concrete is handled from the mixer platform to hopper by conveyor belt loader. Right: Brick machine receives concrete by chute from skip feeding block machine

hopper feeding aggregates to a bucket elevator and will be available for vibrating pipe.

Large pipe and forms are moved from plant to yard and onto trucks for shipment by means of an electric traveling crane. It is a 5-ton crane with a Shepard hoist. The crane operates on rails over a heavy timber overhead structure.

Concrete Blocks, Joists, and Specialties

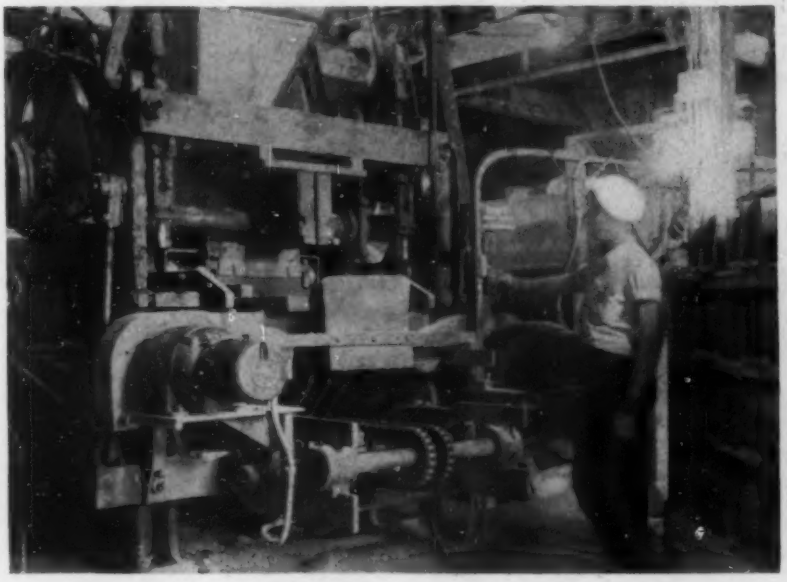
In addition to pipe, the company has manufactured concrete joists and many other heavy reinforced slab sections. Some of the most interesting cast concrete comprise bridge slabs made for railroads operating in this territory. The company has built up a reputation as concrete specialists, and has designed mixes which will meet any normal specification required. Cribbing, precast piles, and guard rail posts are also products kept in stock for railroads and highway departments.

The most recent addition to the plant is a Besser Victory Vibrapac which produces concrete block at the rate of 2000-8-x8-x 16-in. units in an 8 hr. shift. Demand has been so heavy that two shifts are operated per day, six days a week. In spite of this production, the company has been unable to meet demands outside of high priority war industry requirements. Blocks are made with sand and gravel aggregate.

Barrett lift trucks are used to move the wooden racks loaded with block into the steam curing rooms. High strength portland cements and calcium chloride have been used to speed up the curing and maintain strength requirements.

One of the most interesting products made is a concrete fish net weight. The fishing industry requested the company to make up some weights to replace the lead weights used in gill nets as lead is on the critical metal list.

Officers of the company are F. M. Kettenring, president and manager; Wilmagren Bergren, vice-president; Homer A. Bergren, secretary; Mrs. F. M. Kettenring, treasurer; W. F. Paddock, assistant secretary, who is active in directing the affairs of this and several associated plants in neighboring cities.



High production block machine recently installed in the plant

Speed Up Truck Movement with Bulk Cement Plant

Spokane Portland Cement Co. also develops portable sack conveyor to quickly load box cars

DEMANDS for cement in the Spokane area are so heavy that the federal government has placed priorities on the production of the cement companies operating in western Washington and Idaho. Everything possible is being done by the cement companies to facilitate movement of cement to war projects.

While most of the cement manufactured by Spokane Portland Cement Co. moves by rail, a very substantial amount is handled by special bulk cement trucks operated by the contractors. To meet this demand, the Spokane cement company erected a truck bulk cement plant next to its packing plant. It consists essentially of a welded steel storage hopper of 200-bbl. capacity made locally feeding a 15-ft. screw conveyor which dumps into the hopper of the Noble batcher. The scale permits handling up to 5000 lb. per dump, but it has been found desirable to fill trucks in three dumps of approximately 3320 lb. or 5 tons. A pneumatic vibrator applied to the side of the batcher hopper prevents any hanging up of cement.

The cement mill Cera pump (Polysius) with a capacity of 300-bbl. an hour fills the 200-bbl. steel storage tank of the bulk cement batcher. This is a very convenient arrangement as the same pump serves both the mill storage, packing plant, and truck batcher plant by interconnected electrical control.

Conveyor for Sack Loading

In the illustration may be seen a unique portable conveyor for loading sacked cement into box cars, which was designed and built by the company. It comprises a suitably braced steel frame about 25 ft. long to support idlers, pulleys, and a ½ hp. electric motor to drive the conveyor belt. The entire frame is supported on two Chevrolet rubber-tired wheels for easy maneuverability. Wooden blocks and clamps serve as brakes when the conveyor is in operation.

The conveyor receives the sacks from a chute projecting from a short fixed belt conveyor adjacent to the Bates packing machine. About 1200 sacks per hr. are handled by the portable conveyor, the full capacity of the Bates machine.

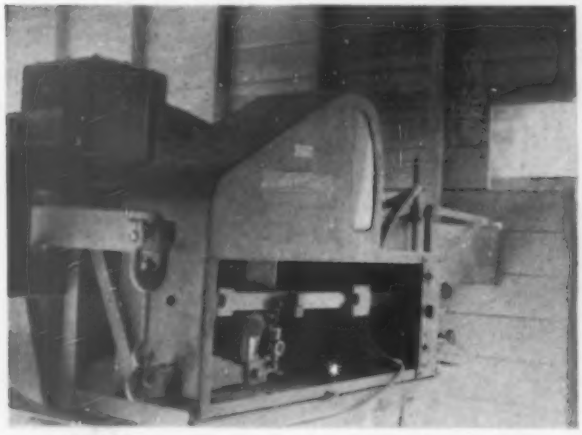
The bulk cement plant and the portable carloader for sacked cement were designed under the direction of F. D. Neil, works manager and superintendent.

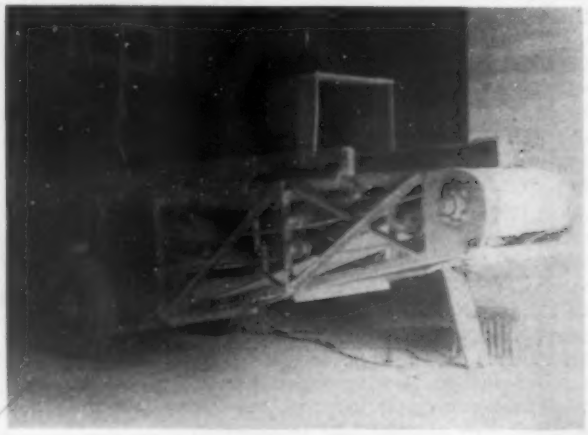
In addition to Mr. F. D. Neill, officers of the company include: R. K. Neill, president and general manager; H. M. Heleniak, vice-president and sales manager; and Walter B. Neill, vice-president.

Bulk cement truck loading plant. Cement is pumped from stockhouse to steel tank

Adds to Ready Mixed Concrete Fleet

READY-MIXED CONCRETE CO., Kalamazoo, Mich., A. L. Bonnette, manager, has added two new Rex Hi-Dump 4 cu. yd. truck mixers to his ever growing fleet. The mixers are mounted on Mack truck chassis. Expansion of defense plant facilities have created heavy demand for ready-mixed concrete in this locality.





Left: Trucks are loaded quickly with batching equipment. Right: Portable conveyor designed to handle sacked cement into freight cars

Stepping Up Block Production

Basalt Rock Co. meets unprecedented demand for concrete block from war industries with new equipment

WHEN THE FULL IMPACT of war construction activities hit the Pacific Coast area, the Basalt Rock Co., was prepared to meet the demands for concrete products with its modern plant and large storage capacity of properly cured units. This company was singularly fortunate in having perhaps one of the largest concrete paved storage areas for concrete units in the United States.

To further fortify its productive capacity, the company had installed a Besser Super Vibrapac block machine and mixer, which was mounted overhead. This arrangement provides a gravity flow for concrete materials. Aggregates are accurately weighed out in a weigh lorry having a Fairbanks scale, and water is controlled by meter.

This company has taken a leading place in the concrete products industry of northern California, having pioneered in the construction of a modern plant to manufacture concrete shingles and concrete block. A complete description of this interesting plant appeared in ROCK PRODUCTS, February, 1939, p. 63. A. G. Streblow is president of the company, and Jeffrey Kay is plant superintendent.

Streamline Convention for Concrete Masonry

DIRECTORS of the National Concrete Masonry Association have decided to hold a "streamlined convention" on February 16 and 17, 1943, at the Sherman Hotel, Chicago. There will be no exhibits, and the sessions will be strictly business, in keeping with wartime conditions. The problems facing the industry are of such vital character that it is expected there will be a good attendance.

Concrete Ship Launched

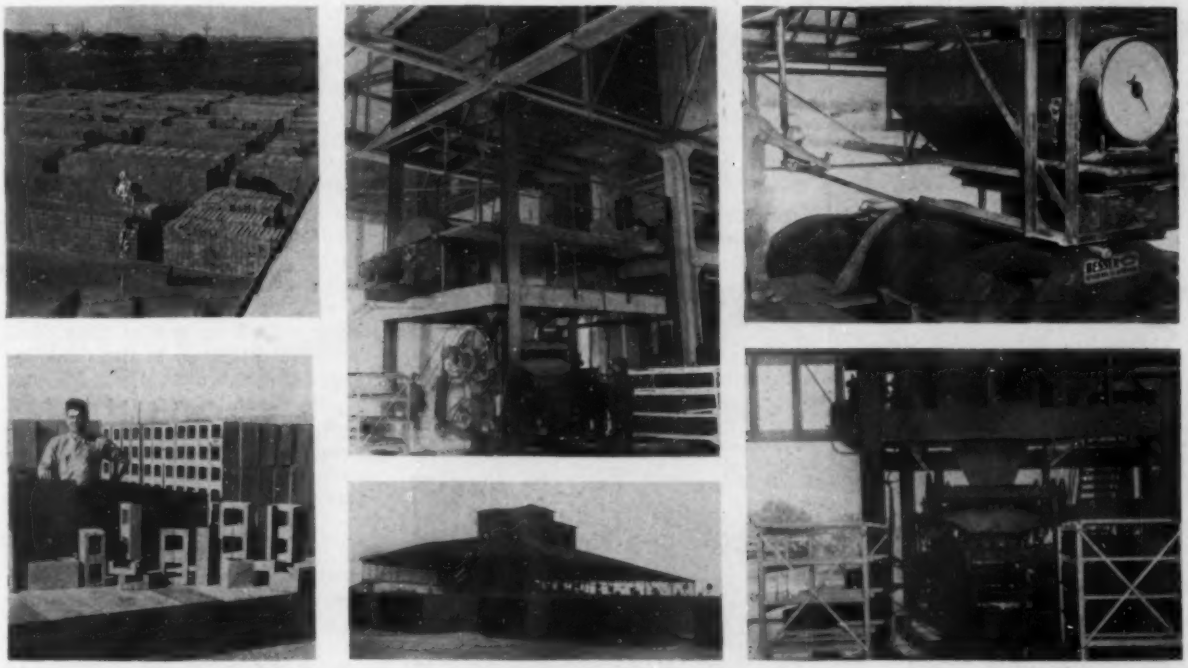
THE FIRST CONCRETE VESSEL built for the Government in 22 years was launched at National City, Calif., recently at the Concrete Ship Construction Co.'s yard.

The 14,000-ton fuel-carrying barge, named Concrete 1, took nearly six months from the laying of the keel to the launching of the barge. Succeeding vessels will require only two and one-half months, company officials said. Bulkheads and sidewalls of the ship are reinforced with steel but 40 percent less of this strategic metal is needed for concrete ships than for ordinary vessels. The 375-ft.-long barge, with a liquid cargo capacity of 8,000 tons, will be towed by tugs.

Burial Vault Committee

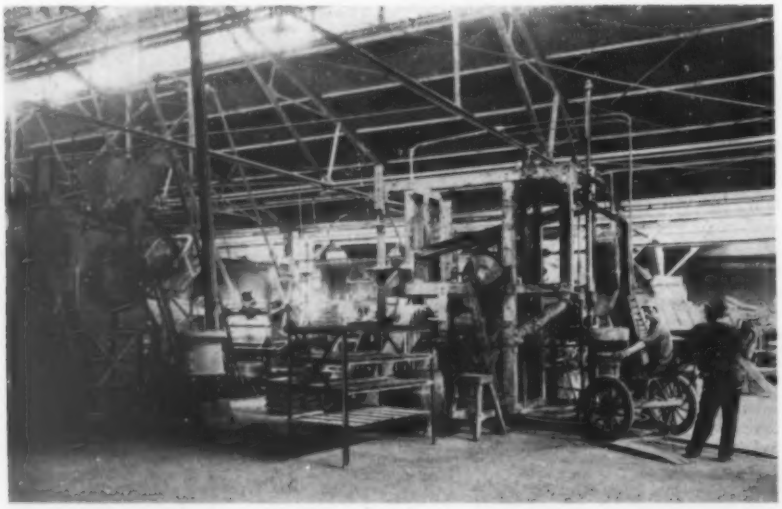
THE DIVISION OF INDUSTRY Advisory committees, WPB, has announced the appointment of the following new committee members.

Members: Gibson Adams, Central Products Co., Farmingham, Mass.; Henry F. Chandler, Perfected Burial Vault Co., St. Paul, Minn.; Carl Guy, Vibrocass Vault Co., Chittenango, N. Y.; Gwyn W. Harris, Harris Vault Co., Winston-Salem, N. C.; Russel D. Harrar, Hillside Cemetery, Roslyn, Penn.; L. K. Huber, Huber & Baxter Co., Cincinnati, Ohio; Edwin C. Pollitt, Western Casket Box Co., Kansas City, Mo.; R. H. Wood, Washington Vault Works, Rockville, Md.; William Woodburn, Con-O-Lite Vault Co., Bethesda, Md.



Above, left to right: Large paved storage yard of Basalt Rock Co., new block machine with mixer mounted above, close-up of mixer with weigh batcher. Below, left to right: "Jeff" Kay, superintendent displaying different types of units made on block machine, general view of plant, and front view of block machine showing convenient set-up for handling block

Aggregates are proportioned by two overhead traveling weigh batchers and discharged into hoppers below for transfer to concrete mixers



Conveyor-fed pipe machine on right with tamper block machine on extreme left. Second pipe machine not shown

Curing kilns are 32- x 120-ft. of extra heavy construction to withstand floods

(Continued from page 62)

curing kilns on racks by a Barrett jack-lift truck.

Curing by low pressure steam is accomplished in six 120-ft. kilns that have the unusual width of 32 ft. They are of concrete masonry wall construction and were built to withstand floods. Roofs were constructed with reinforced concrete joists and heavy steel cross beams supporting a heavy reinforced concrete roof deck. A 60-hp. coal-fired boiler develops the live steam for curing. Radiators in the kilns keep them warm when live steam is not being used.

Concrete block and small pipe are yarded by a tractor-hauled, low trailer. Large pipe are rolled out of the kilns into the yard where a crane with a hook handles the heavier pipe. A stock of 400,000 to 500,000 concrete block is kept on hand in the yard.

Big Pipe Made Outside

A special outside plant was erected two years ago to cast 60- to 84-in. diameter pipe. It consists of a 30- x 150-ft. elevated runway and a central mixing plant, with a 2-bag Jaeger mixer and vertical skip to elevate the concrete to the runway. Originally this setup was acquired for the purpose of taking it to a project site to pour the pipe on the job, and the first cast pipe contract was handled that way.

As permanently set up, the pipe molds are lined up in a row along both sides of the ramp. Concrete is wheeled from the mixer and poured down a spout into the molds. The chute is moved from mold to mold by sliding it on a guide rail. A Mall internal electric vibrator settles the concrete in the molds. Molds and pipe are handled by a 10-ton overhead bridge crane. This crane and a ¾-cu. yd. gasoline crane, equipped with either a hook or a wire sling, load the finished pipe on to trucks. A 40-hp. boiler supplies the steam for curing, live steam being introduced from below, up the barrel of each pipe through steam pipes. Concrete pipe are covered with burlap during the steaming period.

Special Pipe

Semi-circular channel pipe, perforated drainage pipe and concrete meter boxes are three special adaptations of concrete pipe that are manufactured on the McCracken centrifugal head packing machine. The channels are unreinforced and are the equivalent of cutting a pipe in

"ANCHOR"

Complete

EQUIPMENT AND ENGINEERING SERVICE

Equipment for all phases of manufacturing concrete cinder block and other lightweight aggregate units. Our engineering service for new plants and modernizing old ones will help you operate more economically.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns Jolterete, Stearns mixers, pallets, Straublox Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Blystone mixers and others.

Anchor Concrete Mchy. Co.

G. M. Friel, Mgr. COLUMBUS, OHIO

ADD a Concrete Pipe Plant the *UNIVERSAL WAY*

Make Both Large and Small Pipe Profitably

UNIVERSAL not only offers an "all-purpose" machine to produce every size of concrete pipe from 6" to 48" but also equipment for larger sizes such as the 135" pipe we have furnished for highway work.

You are assured of getting superior equipment to produce the finest pipe at a profit from UNIVERSAL.

Write today for catalog and details.

UNIVERSAL
CONCRETE PIPE CO., Inc.
COLUMBUS, OHIO

half down its axis. The maximum size is 36-in. diameter. The unit is for gutters and miscellaneous drainage applications.

Perforated pipe ranging from 6- to 24-in. diameter, with or without reinforcing, are used for highway and airport drainage, and for drainage in connection with the construction of floodwalls. Concrete meter boxes are made in sizes 15- and 18-in. diameter by 2 ft. in length, using the standard corrugated surface pipe molds. Two slots are provided, diametrically opposite from each other, at one end, for the insertion of the water pipe and gauge. Meter boxes are sold to city water departments and to water companies. Adaptations of clay pipe were the only kind sold in this territory for the purpose until the concrete variety was put on the market.

Probably 80 percent of the cement production of the plant is now going into defense work. Concrete blocks go mainly into above-grade construction within a shipping radius of 90 miles and into Huntington, W. Va., Ohio, and Ashland, Kentucky. About 80 percent of all shipments go out by truck. A few years ago the bulk was handled by rail. Unusual rail service is furnished with two private sidings on the property connecting with the N & W Railway. The N & W furnishes switching connections to the C & O and B & O railroads. Cars go direct to connecting lines without delay in railroad yards.

J. L. Richmond is president of the company, and George C. Bowyer is secretary-treasurer and manager of the plant. The general layout of the plant was made by J. L. Richmond and George C. Bowyer. The detail design and the erection was done by William R. Purcell, now manager of the Charleston Concrete Pipe Company, Charleston, W. Va. He was formerly with the Ideal Sand Company, Ohio Gravel Company, and the Ohio River Sand Company and has had many years experience in designing materials handling plants for the aggregate industries. Seldon Bradley is foreman of the plant. Charleston Concrete Pipe Company is a subsidiary of the Union Concrete Pipe Company.

Adds New Products

COMAC BUILDERS' SUPPLY CO., 16 Norman St., Rochester, N. Y., manufacturer of concrete block, has added a cast-stone plant. The company has also taken up the manufacture of concrete joists.

Available for
IMMEDIATE SHIPMENT
. . . a Few

PAK-CRETE
Block Machines

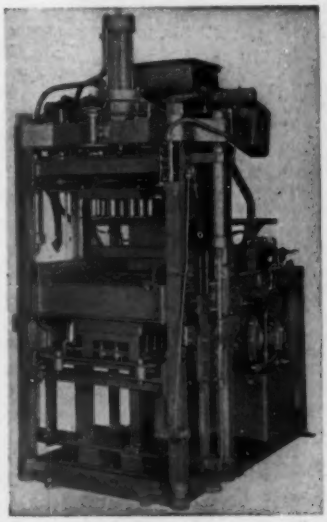
PAK-CRETE is versatile, a LOW equipment investment, gives you combined VIBRATION and HIGH SPEED, SHORT STROKE POWER PACKING.

ACT NOW! Only a few completed machines on hand, none after they're gone because our plant is almost 100% engaged in war production.

WRITE—for PAK-CRETE folder, prices TODAY!

KRAMER PRODUCTS CO.
Industrial St., Peoria, Illinois

HYDRAULIC VIBRA-PRESS



A High Production Machine Making Blocks which are Demanded by the Contractor Endorsed by the Architect Desired by the Mason

The KENT MACHINE CO.
CUYAHOGA FALLS, OHIO

Cement Industry Outlook

PORTLAND CEMENT INDUSTRY probably will break all production and shipment records in 1942—an estimated 200,000,000 bbls. Most producers predict an end of the present war construction boom by midyear 1943. The principal remaining markets for the duration will be war worker housing, the farm market, construction and maintenance of strategic highways. The post-war picture looks bright.

Agree to End Strike

PITTSBURGH LIMESTONE CO., subsidiary of the U. S. Steel Corp., Pittsburgh, Penn., had its quarries in western Pennsylvania tied up by a 3-day strike, early in October. The strike was ended by the union agreeing to submit its case to the War Labor Board. The union is the United Construction Workers, affiliated with the United Mine Workers of America.

Topeka Sand Production Goes to War Projects

PRACTICALLY the entire production of the four sand companies in Topeka, Kan., is being used in war plant production. Most of it is being shipped to an air base.

Sand-Lime Brick Production and Shipments

Seven active sand-lime block and brick plants reported for September and seven for August, statistics for which were published in October.

AVERAGE PRICE FOR SEPTEMBER

	Plant Price	Delivered Price
Detroit, Mich.	....	$16.00
Sebewaing, Mich.	$11.50	....
Saginaw, Mich.	13.00	....
Grand Rapids, Mich.	....	14.00
Seattle, Wash.	16.50	18.50
St. Louis, Mo.	....	....
Watertown, Mass.	12.50	13.50

STATISTICS FOR AUG. AND SEPT.

	*August	**Sept.
Production	2,345,000	2,358,000
Shipments (rail)	650,000	900,000
Shipments (truck)	1,481,070	1,554,253
Stock on Hand	957,474	666,159
Unfilled Orders	650,000	1,725,000

*Seven plants reporting: incomplete, two not reporting stock on hand and three not reporting unfilled orders.

**Seven plants reporting: incomplete, two not reporting stock on hand and three not reporting unfilled orders.

Concrete Pavement Yardage

AWARDS of concrete pavement for September, 1942, have been announced by the Portland Cement Association as follows:

	Square Yards Awarded During September, 1942
Roads	1,517,761
Streets and Alleys	1,636,993
Airports	16,935,383
Total	20,090,137

Increase Bin Capacity

THE PIQUA WASHED SAND & GRAVEL CO., Piqua, Ohio, recently built four new 16- x 16-ft. bins for increased storage capacity. Louis J. Woods, who operates this company and also the Shelby County Washed Sand & Gravel Co., found this additional storage necessary to meet the widely varying demands for different sizes.

Destroyed by Fire

WARREN SAND AND STONE CO., Carpentersville, N. J., lost its washing, crushing and screening plant, seven miles east of Easton, Penn., on October 5, by a fire which consumed practically all the wooden superstructure supporting the equipment. The loss was estimated at $200,000. The plant was completely rebuilt in 1927, and had been in continuous operation since. The company produces sand, gravel, crushed limestone, ready-mixed concrete. It was operating 90 percent of shipments for war and defense work.

Build Addition

PRICE BROS., Dayton, Ohio, recently found it necessary to open an additional plant to meet the requirements for sand and gravel for airports and defense industries. A new Stedman crusher, a 4- x 8-ft. Simplicity vibrating screen, and a rotary scrubber and scalping screen are included in the new plant equipment.

New Silica Plant

MANUFACTURERS MINERAL CO., Seattle, Wash., has started production with a new plant at Chewelah, Wash. Leonard Ainsworth, engineer in charge, reports that between 40 and 50 tons are loaded daily. A crew of eight men is employed at the plant, and two and three men are operating the truck which hauls the sand from the company's property three miles southwest of Chewelah.

Within a short time it is expected that the washing units will be in operation, with storage capacity for 500 tons. This will permit the manufacture of a greater variety of silica products, which at present are being shipped to several coast points in Washington and Oregon.

One oil-burning kiln is being used in the present operation. When the washing unit is completed the washed sand will be fed into the kiln automatically. At present hand power is used to feed the sand into the kiln.

Rental Prices

O. P. A. has issued under date of October 20, Amendment 3 to Maximum Price Regulation 134, which gives maximum rental rates on all sizes and kinds of construction and road maintenance equipment. For example: Air compressors 90 to 130 cu. ft. at 100 p.s.i, $130 per month; $43 per week; $11 per day; jaw crushers, opening 18x36 in., $440 per month; $147 per week; $37 per day. The complete list is necessarily many pages long, but rock products producers can obtain copies for the asking.

Ready Mix Contract

CLARK SAND & GRAVEL CORP., Baltimore, Md., was recently awarded a contract to supply ready mix concrete for a big naval training station job.

New Plant Building

HEMMERICH SAND AND GRAVEL CO., 1460 Lyell Ave., Rochester, N. Y., is building a new plant at Ogden, N. Y., expected to be ready for operation next Spring.

COMING CONVENTIONS

National Concrete Masonry Association, Sherman Hotel, Chicago, Ill., February 16 and 17, 1943.

National Crushed Stone Association, Hollenden Hotel, Cleveland, Ohio, January 25 to 27, 1943.

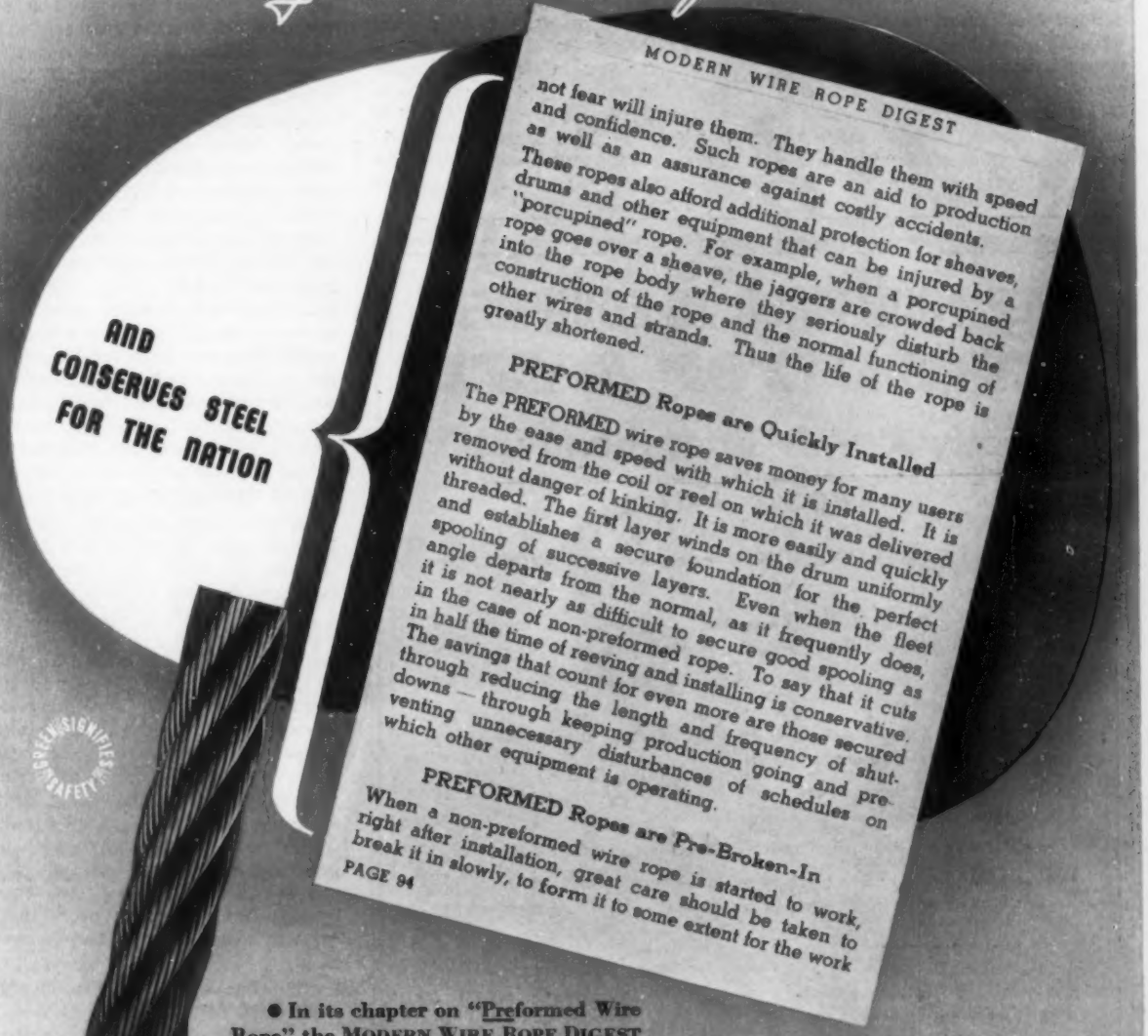
National Ready Mixed Concrete Association, Hotel Statler, Cleveland, Ohio, January 27 to 29, 1943.

National Sand and Gravel Association, Hotel Statler, Cleveland, Ohio, January 27 to 29, 1943.

HAZARD LAY-SET *Preformed*

Saves Money - Gains Time - Defends Production

AND CONSERVES STEEL FOR THE NATION


MODERN WIRE ROPE DIGEST

not fear will injure them. They handle them with speed and confidence. Such ropes are an aid to production as well as an assurance against costly accidents.

These ropes also afford additional protection for sheaves, drums and other equipment that can be injured by a "porcupined" rope. For example, when a porcupined rope goes over a sheave, the jaggers are crowded back into the rope body where they seriously disturb the construction of the rope and the normal functioning of other wires and strands. Thus the life of the rope is greatly shortened.

PREFORMED Ropes are Quickly Installed

The PREFORMED wire rope saves money for many users by the ease and speed with which it is installed. It is removed from the coil or reel on which it was delivered without danger of kinking. It is more easily and quickly threaded. The first layer winds on the drum uniformly and establishes a secure foundation for the perfect spooling of successive layers. Even when the fleet angle departs from the normal, as it frequently does, it is not nearly as difficult to secure good spooling as in the case of non-preformed rope. To say that it cuts in half the time of reeving and installing is conservative. The savings that count for even more are those secured through reducing the length and frequency of shut-downs — through keeping production going and preventing unnecessary disturbances of schedules on which other equipment is operating.

PREFORMED Ropes are Pre-Broken-In

When a non-preformed wire rope is started to work, right after installation, great care should be taken to break it in slowly, to form it to some extent for the work

PAGE 94

● In its chapter on "Preformed Wire Rope" the MODERN WIRE ROPE DIGEST explains in detail *why* Hazard LAY-SET PREFORMED is superior, in so many ways, to non-preformed rope. Here is a reproduction of page 94 of that book—a page that covers, at least inferentially, the points of safety, faster and easier handling, increased machine production and long rope life. Ask your nearest Hazard representative to tell you about this greater-dollar-value rope. Every Hazard man has inherited 96 years of wire rope-making experience. He is qualified to help you.

HAZARD WIRE ROPE DIVISION

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Fort Worth, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Tacoma

AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT, CONN.

HAZARD LAY-SET *Preformed* WIRE ROPE

Canada's Price Control Works

By KENNETH R. WILSON
Ottawa Correspondent

IT IS JUST a year now since Canada donned her self-imposed economic strait-jacket and froze all wages, salaries and prices. Canada's experience shows clearly that an overall ceiling can and does work. Living costs had risen 7 percent in the seven months prior to price control. They were held to within a 1 percent rise in the next nine months. In the same nine months period, United States living costs rose 6½ percent, despite the partial price ceiling of last Spring. Canadian Price Czar Donald Gordon estimates that housewives' bills would have soared 10 percent in Canada had it not been for price control. The saving he places at somewhere between 300 and 350 million dollars, against which the out-of-pocket costs in the form of public subsidy to enable business to operate within the ceiling have been only about 15 million dollars.

In 12 months of operation, there has been very little "puncturing" of the ceiling except in the case of farm products, (notably wheat and beef) and seasonal goods. Only a few goods or services have been excluded from the ceiling since the policy was originally introduced. The most notable recent exemption has been newspapers, magazines and periodicals, which were removed from the ceiling in August.

Most troublesome problem has been the farmer. Here the job was to maintain a price ceiling and at the same time ensure adequate supplies of foodstuffs for increased home and export demand. In several instances this had to be done by outright subsidy—butter, milk, etc. In other cases (wheat and beef) the price ceiling was openly punctured. The farmer is still the biggest threat to the success of Canada's price ceiling.

Another threat is wages. Although Canada froze all wages and salaries (except to allow a cost-of-living bonus which rises or falls with each 1 percent change in the cost of living, considerable power was left in the hands of wage boards in each of the nine provinces to permit "adjustments" and iron out anomalies in depressed or substandard areas or industries. Today, the cumulative effect of these increases is beginning to make itself felt in higher costs. In some cases these now threaten the Price Board's ability to keep the price lid nailed down as tightly as has been the case in the past. These boards have handled over 10,000 cases in recent months, the majority of which have come from employers themselves. Chief reasons for the application are:

(1) Conversion of low-wage peace time industry to higher wage war production.

(2) The wish to overcome wage differences between neighboring centers to keep workers from drifting.

(3) The desire of management to change the basis of pay and introduce the incentive system.

Behind these applications (over 4000 of them have come from one province, Ontario) is the significant fact that the old-time differentials between factories and communities are being gradually ironed out and eliminated. It is doubtful if the old differentials will be permitted to return in the post-war period. Certainly many of them will not return.

KEEP YOUR WASHING EQUIPMENT WORKING AT *TOP SPEED*

Specify *Eagle* Interchangeable Repair Parts

Our engineers designed Eagle Washers to withstand terrific wear. That is why:

Timken Roller Thrust Bearings are used in the housing at upper end of tub, which takes all the end thrust of a screw shaft.

Flights are made from a special iron and the metal is deeply chilled to insure long wear.

Bronze sleeves are pressed on lower end of shaft to eliminate rust accumulation and prolong shaft life.

Drive Gears and pinions are steel, cut on precision machines, to insure easy running and full power transmission.

Our engineers are ready and waiting to assist you at all times.

Our service department is anxious to furnish you with genuine Eagle Repair Parts and we will give you as prompt delivery as possible.

Eagle Products include Spiral Screw Washers, Paddle Type Log Washers, Sand Tanks, Sand Drags, Sand Dewaterers, Shale Removers, Sand and Gravel Crushers, Swintek Screen Nozzle Ladders.

EAGLE IRON WORKS

☆ DES MOINES, IOWA ☆

Conveying Cement

(Continued from page 52)

100-cu. yd. of premixed concrete per hour. In all three plants there are five Rex mixers with approximately each having 60 cu. yd. capacity or a total of 300 cu. yd. per hour.

Agitator mixer trucks comprise 22 units, 16 Jaeger of 2-cu. yd. capacity and 6 Rex of 2½ cu. yd. capacity. There are also 20 so-called "bathtub" type delivery units for premixed concrete.

The Tacoma, Washington, ready-mixed concrete plant operates three Jaeger and nine Rex agitator units, four of which are 2½ cu. yd. capacity and eight are of 1½ cu. yd. capacity.

Officers of the company are Gordon N. Scott, president; Nels E. Johanson, vice-president; O. E. Stewart, secretary-treasurer, and George D. Christensen, general superintendent. The Tacoma plant is operated under the name of George Scofield Co.

Directors Meeting of S. & G. Association

(Continued from page 39)

Md. Past-Presidents, in addition to John Prince, who is also elected by his district, Robert J. Potts, Waco, Tex.; Hal. V. Owens, Utica, N. Y.; Alex. Foster, Jr., Philadelphia, Penn.; J. Rutledge Hill, Dallas, Tex.; Paul P. Bird, Boston, Mass.

New Members N.S. & G.A.

THE FOLLOWING producing companies were added to the membership of the National Sand and Gravel Association in 1942: Clark Sand and Gravel Co., Baltimore, Md.; The Cleveland Builders Supply Co., Cleveland, Ohio; Dawes Silica Mining Co., Thomasville, Ga.; Hamlin Sand and Gravel Co., Vernon, Texas; Hersey Gravel Co., Hersey, Mich.; Jefferies & Betts, Fort Worth, Texas; Missouri-Illinois Material Co., St. Louis, Mo.; The Muskingum River Gravel Co., Zanesville, Ohio; Southern Materials Corporation, Norfolk, Va.; Standard Materials Corporation, Indianapolis, Ind.; Southern Ohio Quarries Co., Columbus, Ohio; Texas Sand and Gravel Co., Amarillo, Texas; Waco-Tex Sand and Gravel Co., Waco, Texas; Waukesha Washed Sand and Gravel Co., Milwaukee, Wis.

Fire Damage

TOMS BROOK LIME AND STONE CO., Woodstock, Va., suffered fire loss estimated at $15,000 to its plant on October 11.

Manganese Steel Ball Mill Liners *Save Metal . . . Increase Production*

Today, to save is to serve, and many operators of ball mills are doing just that—serving the nation's war effort by using Amsco manganese steel liners, thus minimizing replacements and insuring more continuous production.

In most cases liners of 13% manganese steel, "the toughest steel known," outlast liners of other metals, shutdowns are fewer, and fewer man-hours are wasted on maintenance.

Increased production is aided by manganese steel liners since they can be made thinner than hard, brittle metals, allowing a larger inside mill diameter. Not so heavy as hard iron liners, they take up less shipping weight and require less power to operate the mill despite the heavier ball charges that are possible with the use of manganese steel liners.

The unequalled toughness of manganese steel permits designs of liners that are not always practical with other materials. Metals that fracture easily from ball impact obviously cannot have lifting ribs to increase cascading action within the mill.

The advantages of manganese steel are many—not only for liners, but also for other milling, mining and quarrying equipment parts subjected to shock and abrasion. Such parts of manganese steel help to avoid the wastage of less durable metals which may, nevertheless, be suitable for easier operations. Send for Bulletin 1141-L which gives performance data on manganese steel liners in metal ore-grinding ball mill service.

L-128—Part of an order for 500 tons of shell liners, approximately 900 lbs. each for 10' by 10' ball mills. The user, like many processors of ore, has found 13% manganese steel the most economical.

Amsco

AMERICAN MANGANESE STEEL DIVISION
OF THE AMERICAN BRAKE SHOE & FOUNDRY CO.
Chicago Heights, Illinois

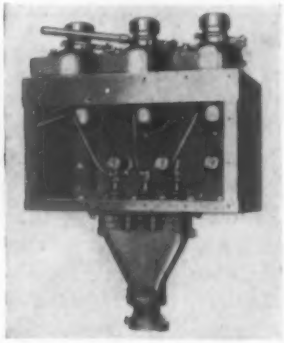
Genuine Manganese Steel, "The Toughest Steel Known"
Chromium-Nickel Alloy Castings for heat and corrosion
Power Shovel Dippers, Dredge and Industrial Pumps
Welding Materials for reclamation and hard-surfacing

FOUNDRIES AT CHICAGO HEIGHTS, ILL., NEW CASTLE, DEL., DENVER, COLO., OAKLAND, CALIF., LOS ANGELES, CALIF., ST. LOUIS, MO
OFFICES IN PRINCIPAL CITIES

NEW EQUIPMENT

Oil Fuse Cutouts

GENERAL ELECTRIC Co., Schenectady, N. Y., has announced a line of metal-enclosed assembly of gang-operated oil fuse cutouts for economical short-circuit protection,



Typical installation of metal-enclosed assembly of gang-operated oil fuse cutouts

either for single- or three-phase.

Each unit is factory-assembled with flexible, insulated cable leads ready for connection to either single- or multi-conductor cable. The leads enter the individual cutouts above the oil level, thus preventing loss of oil. Switching requires merely throwing a lever 90 deg. Fuse carriers can be removed without disturbing the gang-operating mechanism.

It is said that these assemblies are particularly well adapted for use (indoor or outdoor) in industrial plants for branch circuits, individual transformers or banks, motors, control apparatus, and electric-heating and other equipment. The assemblies for short-circuit protection and switching come in three ratings: 2500 volts, 100, 200, and 300 amp.; 5000 volts, 50 and 100 amp.; and 7500 volts, 100 amp., for switching only, 2500 volts, 150, 250, and 350 amp.; 5000 volts, 150 and 250 amp.; and 7500 volts, 150 amp.

Industry at War

ALLIS-CHALMERS MANUFACTURING Co., Milwaukee, Wis., has issued a profusely illustrated brochure entitled, "We Work for Victory and We Plan for Peace" that shows what products this company is making under war-time conditions and where and how these products are helping to produce more guns, tanks, planes and ships. In addition to power-making and distributing equipment, the illustrations and descriptions cover mining, cement manufacture, road building and other industrial applications of this company's equipment. The book is being distributed in conjunction with the showing of a sound moving picture with the same title and the same general theme.

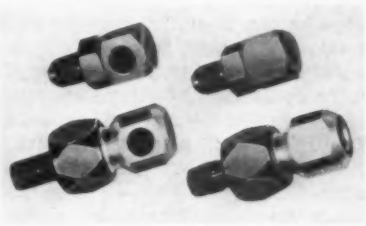
Angle Swivels for Oil Grease and Air Lines

TRABON ENGINEERING CORPORATION, Cleveland, Ohio, has introduced a new line of straight and 90 deg. angle swivels for use in making oil, grease, air and other line connections between stationary, and revolving, oscillating or other moving surfaces.

These swivels are available in two different constructions for different requirements. The standard ball bearing swivels are available in ⅛-, ¼-, ⅜-, ½-, ¾- and 1-in. pipe sizes. Due to the ball bearing construction, these swivels turn freely at any pressure without binding.

Light duty swivels are built without balls. They are intended for use only in lighter work when space limitations do not permit the use of standard ball bearing swivels, and are offered only in ⅛- and ¼-in. pipe sizes.

Both standard ball bearing and light duty swivels are furnished regularly with right hand threads in both head and stem. Swivels with left hand threads in either the head or stem,



Different types of swivels for use in making oil, grease, and air lines

or in both the head and stem,—and swivels built from special materials for handling corrosives, etc., can be furnished on special order.

Industrial Lift Trucks

LEWIS-SHEPARD Co., Watertown, Mass., announces a new line of medium capacity (3000 lb.) industrial lift trucks which are of the tilting fork type, either telescopic or non-telescopic. The trucks have either gasoline or electric power. Among the improvements are low slung construction to keep the center of gravity low as an aid to maneuverability and stability.

It is intended to bridge the gap between hand lift trucks and extra heavy-duty power trucks. Traction speed is 7.5 m.p.h. and lifting speed 30 ft. per minute full load for the model GFTT gas truck and, 5 to 6 m.p.h. and 18 ft. per minute for the model EFTT electric machine.

Gas lift truck for medium capacities

Manufacturers' Division: Sand and Gravel

AT A SPECIAL MEETING of the Manufacturers' Division of the National Sand and Gravel Association, held in New York City, September 30, eleven member companies were represented.

The principal topic for discussion and action was the part to be played by the Division at the coming annual convention in Cleveland, Ohio, January 27-29, 1943. It was decided to have no exhibit.

The chairman of the Manufacturers' Division, Irwin F. Deister, was given authority to make arrangements for a dignified party to be given by the Division for the producers in the early evening of the first day of the convention, and to arrange for club or lounging rooms near the convention hall, where producers and manufacturers' representatives could meet on common ground throughout the convention. Private room exhibits and room parties are to be barred.

The main idea back of these arrangements is that the members of the Manufacturers' Division do not wish to lose the intimate contacts they have maintained at these conventions with the active member producers. The times do not lend themselves to exhibits; and elaborate entertainments, etc., are also out of keeping with war times.

Executive Secretary of the National Sand and Gravel Association, V. P. Ahearn, who was present throughout the session, expressed the opinion that there would be no travel restrictions on business men who go to their industry conventions. The government views such conventions as helpful to the war effort and as opportunities for government officials to contact whole industries at one time and place.

To meet the loss of income to the Association through temporary abolition of the exhibit and to provide for future contingencies when industry production may fall off rapidly, as well as to provide for the entertainment features of the Cleveland program referred to, the dues of associate members of the Manufacturers' Division were increased by unanimous vote from the present $50 per year to $100 per year.

It was reported that manufacturers of ready-mixed concrete equipment, who have been large exhibitors at the conventions, had volunteered to contribute the usual fees for exhibit space, in addition to their group's regular dues.

M. B. Garber, loaned by the Thew Shovel Co. to the War Production Board, where he heads up the construction machinery branch, was present and described in general what his branch was attempting to accomplish and why.

The following members were present:

American Manganese Steel Co.; Perry Nagle.
Deister Machine Co.; Irwin F. Deister.
Hendrick Manufacturing Co.; Bruce G. Shotton.
Koehring Co., E. J. Goes.
McLanahan & Stone Corp.; J. C. McLanahan.
Pit and Quarry; Stanley A. Phillips, W. A. Wilson.
Robins Conveying Belt Co.; A. E. Conover, Alfred S. Otton.
Rock Products; Nathan C. Rockwood, W. A. Buschman.
John A. Roebling Sons Co.; J. Lennell Berger.
Taylor-Wharton Iron and Steel Co.; J. A. Trainor.
Thew Shovel Co.; M. A. Garber.

•

LAKE ERIE LIMESTONE CO., Hillsville, Penn., has been awarded a "minute man" flag in recognition of 100 percent of its employes subscribing to purchase of $2200 per month of war savings stamps and bonds. There are 115 employes at the Hillsville plant. Paul Durbin is superintendent.

Another Cement Plant controls proportioning with MERRICK FEEDOWEIGHT

MERRICK FEEDOWEIGHT at Calaveras Portland Cement Company

Calaveras is another important producer using FEEDOWEIGHTS for accurately feeding raw materials into process and giving a record of the weight of the materials handled.

The FEEDOWEIGHT with its power-operated feed gate regulator is consistently accurate and fully automatic in operation.

★ MERRICK SCALE MFG. CO. ★

188 AUTUMN ST. PASSAIC, N. J.

Conveyors

(Continued from pages 53, 54 and 55)

There are two general methods which may be used to accomplish this. The tonnage can be estimated from the number of operating hours and the average hourly load, the average hourly load being determined by periodic tests as described before. The other method is to compute the tonnage on each belt as a certain percentage of the shipments. Since shipments are often kept showing the accumulative amounts to date, the total shipments for any period is an easy figure to obtain. The percentage of total shipments carried by any one particular belt will be determined by the plant layout and method of operation. For some belts it seems almost impossible to get anywhere near a reasonably accurate figure, but it is often found that the most difficult cases are for relatively unimportant or intermittently operated belts. In one plant such a method was found to work out showing that each belt carried the following percentage of the total shipments:

Manuf'r.	Width	Length	Plies	Weight	Tensile	Friction	Top Cover	Bottom Cover	Cost per 1000 cu. yd.
A	30 in.	64 ft.	6	32 oz.	2500 p.s.i.	20	3/16 in.	1/16 in.	$0.30
A	34 "	64 "	6	32 "	2500 "	18	3/16 "	1/16 "	.80
B	34 "	55 "	6	32 "	2500 "	20	3/16 "	1/16 "	.25
C	34 "	57 "	6	32 "	2500 "	16	3/16 "	1/16 "	.42
B	34 "	57 "	6	32 "	2500 "	16	3/16 "	1/16 "	.38
D	34 "	57 "	6	32 "	2500 "	16	3/16 "	1/16 "	1.01
E	34 "	57 "	6	32 "	3500 "	20	3/16 "	1/16 "	.34
E	34 "	57 "	6	32 "	3500 "	20	3/16 "	1/16 "	.31
E	34 "	57 "	6	32 "	3500 "	20	3/16 "	1/16 "	.28

CONVEYOR No.	PERCENT OF SHIPMENTS
1	122%
2	122%
3	138%
4	16%
5	118%
6	91%
7	74%
8	43%
9	27%
10	20%
11	11%
12	11%
13	4%
14	4%
15	12%
16	12%
17-20	100%

In passing, it might be noted that while for most conveyors the tonnage record is the important factor, there are a few belts which carry small total tonnages because of intermittent operation. These belts often ultimately fail because of age rather than wear. On such conveyors the length of service is a better basis for comparison than the tonnages. Any belt which fails because of age or external conditions such as weather or heat would have carried more if it had been supplied with more load during its lifetime.

Reasons for Keeping Records

One of the important reasons for keeping records for belts in a standardized manner is that belts often last so long that original data can be lost or misplaced when the time comes for re-ordering. When that time does come an accurate record of past performance is of utmost assist-

Perhaps the curtailment of rubber has put your plant on the "spot." You've got to do something about the problem of material handling. It is possible that track haulage is the answer. If so, investigate Plymouth Locomotives for their versatility, dependability and low initial cost. Plymouths have a record behind them . . . a record for low cost operation, minimum upkeep and dependable performance. Plymouths are built to stand up in all kinds of service and under all conditions.

While our plant is "geared up" on work for Uncle Sam, we can possibly co-operate with you in the installation of track haulage. Write and tell us your requirements . . . no obligations, of course.

PLYMOUTH GASOLINE and DIESEL LOCOMOTIVES
PLYMOUTH LOCOMOTIVE WORKS
Division of The Fate-Root-Heath Co. PLYMOUTH, OHIO, U. S. A.

ance. Although reasonable specifications can be drawn up for most any belt, the performance record proves the wisdom of the selection or at least indicates where improvements can be expected. Of course, it takes several years before the performance records are of most value, but for short and greatly used conveyors the records soon show their worth.

In making a comparison of costs the usual practice is to refer to the cost per ton or per yard. The resulting fractional part of a cent is not an easily pictured quantity and is so small that its importance may be neglected. For this reason, we have expressed our unit costs in cents per 1000 cu. yd. carried. The resulting figure seems to be more easily appreciated. The unit costs for belts on different conveyors vary greatly, and sometimes the costs for different belts on the same conveyor will be found to be surprisingly different.

At one plant we have found the cost of belting to vary between 15c per 1000 cu. yd. to $2.00 per 1000 cu. yd. with the average being about 75c. These costs for different types of service cannot be directly compared unless the conditions are very similar, and this is seldom the case. Such a comparison, however, will show where the biggest improvements can be made and often indicates where something in the design or operating conditions should be corrected. We become so accustomed to our own conditions that it often takes an outsider to point out obvious errors. The cost comparison is like that of an outsider and will show faults that we did not realize were so important.

An example of the variation in costs of several belts installed at the same time in one plant on conveyors of varying conditions is shown in the following table:

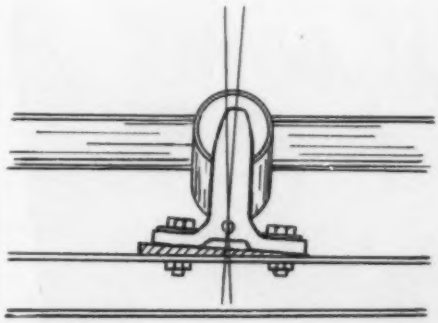
CONVEYOR No.	WIDTH	LENGTH	COST 1000 CU. YD.
A	42 in.	611 ft.	$2.05
B	42 "	460 "	1.26
C	36 "	235 "	1.89
D	36 "	440 "	.37
E	30 "	110 "	.48
F	30 "	136 "	.15
P	36 "	516 "	.53
Q	36 "	216 "	.46
R	36 "	225 "	.94
S	36 "	92 "	.42

Although it is not practical here to go into all the different operating conditions that might account for the great variation in costs, there are several apparent anomalies which deserved investigation. The belts on conveyors C and R apparently are at too great a variation with the other belts in this list, and subsequent replacements have proved that these apparent high costs were actually greater than they should have been.

Perhaps an even more interesting cost comparison can be made of several belts which over a period of years were installed on the same conveyor. During this time the operating conditions were the same, the only difference being the belt manufacturer and some changes in belt quality as noted in the table on page 80.

A study of this table shows that with the exception of the second belt at 80c and the sixth belt at $1.01 the costs do not vary greatly, and that in general the better quality belts are the most economical for this conveyor. A table such as this is the best possible answer to claims made by various manufacturers for superior methods in belt construction and with such a table the plant operator is in a position to know what service he should expect from his belts.

(To be continued)



Design Idea

Tilting idlers by "shimming up" the rear foot is being done by a number of aggregates producers where practice proves a slight forward tilt of the idler prevents crooked running. The operator should be careful to avoid too much tilt to prevent excess wear on pulley side of belt.

Your

BELTING IS HARD TO REPLACE–MAKE IT LAST

FUNDAMENTAL CARE

One important job of the maintenance man or inspector is to:

Check for "frozen" idler pulleys.

An idler or a single pulley on the idler occasionally tends to stick or "freeze" to the shaft.

Such a condition, if not immediately corrected, may cause serious unnecessary wear and shorten the belt's life.

. . . Another way to conserve rubber belting is to buy Goodall Brands—Built to Last Longer.

PHILADELPHIA NEW YORK BOSTON
TRENTON PITTSBURGH CHICAGO
GOODALL RUBBER CO. OF CALIFORNIA
GOODALL RUBBER CO. OF TEXAS

GOODALL KNOWS SYNTHETICS

Ever since Synthetic Rubber was commercially introduced, Goodall has been a foremost compounder of this man-made rubber. Today, we are "batching" five of the basic synthetic rubbers for everyday production runs in our factory. When new synthetic and plastic substitutes become available, Goodall-Whitehead chemists and technicians are ready with the precise formulas, timing and control techniques so necessary for safe, dependable products.

Mill: Trenton, N. J. (Est. 1870)—72 Years of "Know-How", Our Most Valuable Commodity.

GOODALL
RUBBER COMPANY, INCORPORATED

FINANCIAL NOTES

RECENT DIVIDENDS

		1942
Florida Portland Cement Co. 7% pfd.	$3.50	Nov. 17
Lehigh Portland Cement Co.	.37½	Nov. 2
		1943
Lehigh Portland Cement Co., pfd.	1.00	Jan. 1
Medusa Portland Cement Co.	.25	Oct. 7
Medusa Portland Cement Co., pfd.	1.50	Oct. 1
Pacific Portland Cement Co. 6½% pfd. (p100) (arrears)	1.00	Oct. 29
Riverside Cement Co. 1st pfd.	1.50	Nov. 1
Signal Mountain Portland Cem. Co. 8% pfd.	4.00	Oct. 31
Superior Portland Cement Co. Cl. B.	.50	Oct. 28

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LONGHORN PORTLAND CEMENT CO., San Antonio, Texas, had the following income account for the six months ending June 30:

	1942	1941
Net before taxes	$880,225	Not stated
Federal income tax	589,352	.....
Net profit	290,872	$340,125
Preferred dividends	32,145	32,237
Common dividends	187,185	187,185
Surplus for per.	71,542	120,703
Previous earnings surplus	694,009	618,954
Tax adjust., etc.	cr 15,179	cr 81,582
Res., pfd. retire.	5,357	5,373
Earning's surplus, 6-30	775,373	815,868
Earnings, preferred share	$54.30	$63.30
Earnings, common share	1.11	1.31
No. of preferred shares	5,357	5,373
No. of common shares	249,580	249,580

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ALBERENE STONE CORP. OF VA., New York, N. Y., for the six months ended June 30, had the following income account:

Net sales	$364,801	$401,162
Cost of sales	260,089	264,001
Administrative expense	69,592	73,353
Depreciation and depletion	16,301	18,272
Taxes	6,000	5,400
Cash discounts	289	467
Operating income	12,530	39,669
Other income	11,189	9,688
Total income	23,719	49,357
Miscellaneous interest	.....	639
Alberoyd division loss	cr 145	1,560
Federal taxes	9,488	14,615
Net income	14,377	32,543
Earned per share	$0.22	$0.49
No. of shares	65,745	65,745

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NATIONAL GYPSUM CO., Buffalo, N. Y., reported the following earnings statement for the six months ended June 30:

	1942	1941
Gross sales	$10,211,421	$10,381,040
Cost & expenses	8,736,197	8,507,195
Depreciation & depletion	341,598	309,749
Operating profit	1,133,626	1,564,096
Other income	84,339	63,507
Total income	1,217,965	1,627,603
Interest, etc.	112,957	93,817
Doubtful accts., etc.	132,855	134,739
Federal income tax	[1] 342,700	292,000
Excess profits tax	[1] 228,400	417,000
Net profit	401,053	690,047
[2] Times chg. earn.	9.61	15.91
Earn., preferred share	$6.17	$11.21
No. of preferred shares	64,980	61,550

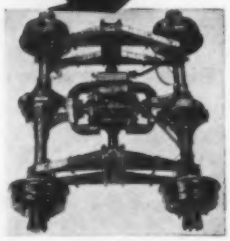
[1] Based on 1942 Revenue Act or passed by the House.
[2] Before income and profits taxes.

•

ARUNDEL CORP., Baltimore, Md., reports for the six months ended June 30, 1942, a profit of $672,309 after charges, but before federal and state income taxes. This compares with $565,546 in the first half of 1941. Current assets as of June 30, last, amounted to $4,633,469 and current liabilities were $2,742,832, comparing with $3,597,411 and $1,345,458, respectively, on June 30, 1941.

•

BASIC REFRACTORIES, INC., Cleveland, Ohio, for the six months ended June 30, 1942, reported a net profit of $103,764 after federal income taxes, depreciation, etc., equal to 30 cents a share on 350,000 shares of com-



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You may not be building an Alaskan highway, but you may be building an airport runway or a vital road, or you may be hauling logs or other heavy loads that are essential today. You need **BIG-CAPACITY, HEAVY-DUTY TRUCKS.**

Standard heavy trucks are not available—but don't let that stop you. In the U. S. A. and all over the world 1½ to 3-ton trucks have been converted to husky heavy-duty vehicles that do the job better and cost less. Act quickly while Uncle Sam still approves. Contact your nearest Truckstell-**THORNTON** dealer or wire the factory direct. Trained men will engineer this equipment right to your **PARTICULAR JOB.**

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Manufacturers also of the THORNTON automatic-locking DIFFERENTIAL
"When you need TRACTION you need THORNTON"

mon stock. This compares with $178,714 or 51 cents a share for the corresponding period in 1941. Provision for federal taxes on income for this year has been made at rates approved by the House on July 20, 1942, including normal and surtax of 45 percent and excess profits tax of 90 percent, totaling $364,000 or $1.04 a share, against tax provision of $210,000 or 60 cents a share in the first half of 1941.

•

LONE STAR CEMENT CORP., New York, N. Y., reported comparative income accounts for six months ended June 30 as follows:

	1942	1941
Sales	$16,050,115	$13,688,088
Costs & expenses	10,165,889	8,839,872
Depreciation & depletion	1,217,544	1,308,197
Operating profit	4,666,682	3,540,019
Other income	189,810	191,965
Total income	4,856,492	3,731,984
Income & profits tax	2,430,000	1,123,306
Other taxes	417,125	325,449
[1] Misc. charges	627,867	349,217
Net profit	1,381,501	1,934,012

[1] Includes provision for doubtful account and contingencies.

•

CONSOLIDATED CEMENT CORP., Chicago, Ill., has presented the following income accounts for the years ended June 30:

	1942	1941
Net sales	$1,366,562	$1,110,180
Cost of sales	916,859	757,672
[1] Selling, etc., expense	210,115	216,844
[3] Operating profit	239,588	135,664
Income bond int.	31,325	39,387
Income note int.	3,651	4,143
Bond disc. & exp.	4,361	4,143
Loss on assets	2,553	1,629
[2] Net profit	197,698	86,362
[2] Times chg. earn.	6.03	2.81
Earn., cl. A shares	$1.97	$0.86
No. of cl. A shares	100,513	100,513

[1] Includes expense applicable to non-operating periods (less miscellaneous income).
[2] Before Federal income taxes.
[3] After depreciation and depletion: 1942, $97,358; 1941, $89,802.

•

SCHUMACHER WALL BOARD CORP., Los Angeles, Calif., reports for the quarter ending July 31:

Net profit, after Federal income and excess profits taxes:

	1942	1941
3 months to July 31	$32,665	$68,648
Earnings, preferred share:		
Priority basis	$1.15	$2.41
Partic. basis	0.50	0.72
Earnings, common share	0.28	0.73
Number of preferred shares	28,460	28,460
Number of common shares	66,000	66,000

•

UNITED STATES GYPSUM CO., Chicago, Ill., reported the following comparative income account for the six months ended June 30:

	1942	1941
Operating profit	$6,997,334	$8,184,058
Depreciation & depletion	1,328,005	1,308,113
Net operating profit	5,669,328	6,875,945
Other income	218,291	233,530
Total income	5,887,619	7,109,475
Plant asset retire.	cr 33,503	dr 18,501
Fed. anti-tr. exp.	118,663	68,147
Income taxes	1,544,000	2,005,000
Excess prof. tax	1,813,000	1,806,000
Net income	2,445,460	3,211,826
Preferred dividends	273,777	273,777
Common dividends	1,196,373	1,195,662
Surplus for period	975,310	1,742,387
Earn., preferred share	$31.26	$41.06
No. of preferred shares	78,222	78,222

Notes: (a) 1942 income and excess profits taxes estimated on basis of latest rates proposed in pending legislation.
(b) Above statement includes net profits of Canadian subsidiaries: 1942, $65,062; 1941, $219,353.

•

LEHIGH PORTLAND CEMENT CO., Allentown, Penna., issued a consolidated earnings sheet for the 12 months ending September 30, 1942, which compares with the same period as follows:

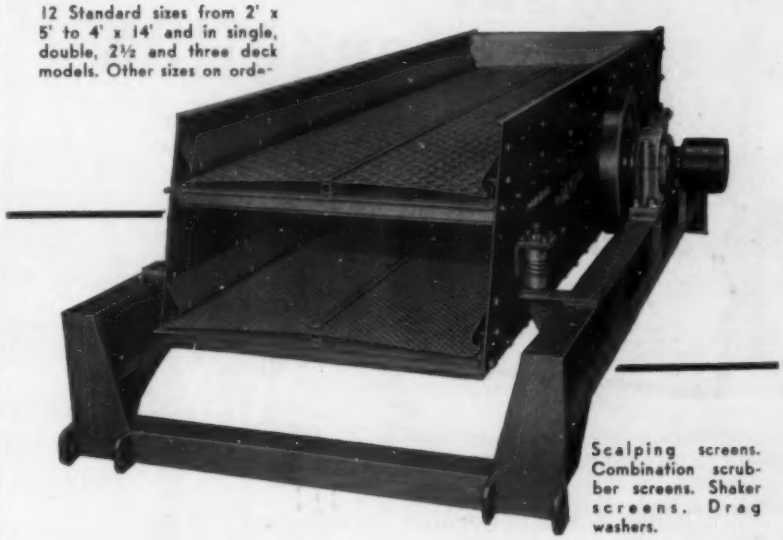
	1942	1941
Net before taxes	$5,768,645	$4,599,439
Federal income tax	(1) 3,808,101	2,011,554
Net profit	1,960,544	2,587,885
Preferred dividends	226,952	227,004
Surplus for period	1,733,592	2,360,881
Earnings, pfd. share	$34.55	$45.60
Number of preferred shares	56,741	56,751

Interim Earnings, per common share ($):

12 mos. to:	1942	1941	1940
March 31	2.93	3.11	2.58
June 30	2.66	3.32	2.58
September 30	2.39	3.25	2.38
December 31	...	2.78	2.41

Balance! That's why DIAMOND Screens Outperform

12 Standard sizes from 2' x 5' to 4' x 14' and in single, double, 2½ and three deck models. Other sizes on orde-



Scalping screens. Combination scrubber screens. Shaker screens. Drag washers.

Daily maximum output at low production costs demands a vibrator that performs smoothly and efficiently —that operates with a true circular motion, forcing the material evenly over the screen and downward to the delivery end . . . DIAMOND vibrating screens are properly balanced. And the *improved* 1942 models have features that demand careful consideration . . . Diamond Engineers will gladly cooperate with you in solving your crushing and screening problems, and at no obligation.

JAW CRUSHERS	CONVEYORS	FEEDERS
ROLL CRUSHERS	QUARRY PLANTS	HOPPERS
SCREENS	PORTABLE PLANTS	BINS

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DIAMOND IRON WORKS, INC.

Established 1880
AND THE MAHR MANUFACTURING CO. DIVISION
1800 NORTH SECOND ST., MINNEAPOLIS, MINNESOTA, U.S.A.

Lime Forum

(Continued from page 57)

the capacity of many existing plants is increased 50 percent by just closing the kiln tops and putting them under induced draft with a fan. Others have doubled capacity by this means and some additional re-arrangements. In one plant, located in Arkansas, capacity was doubled by adding fans, and will be trebled when the re-arrangement program is complete. The amount of steel that went into the whole was insignificant compared to what it would have been with new kilns.

What $40,000 Did

An Oklahoma plant that four months ago was making 30 tons of lime is today making 160 tons, and the whole was accomplished at an expenditure of but $40,000. Two old kilns were rearranged, a new kiln built, but the shell was the re-rolled steel of an old tank. Very little new steel or new equipment went into the plant, excepting only the fire brick.

Recently some work was done on a standard size 175 ft. rotary. It had no cooler and normal average capacity was 168 tons. The heat in the hot lime drawn represented a terrific wastage. So a simple cooler was constructed; priorities did not figure in it, since it was made in the plant shop, and for this same reason it also was very cheap and the very little steel in it was no burden on the country's resources.

On its installation capacity jumped to 185 tons, and the fuel ratio was bettered by half a pound per ton of lime. Later, by still further adjustment, the capacity was raised to over 200 tons, with still further possibilities remaining. What the limit of capacity of such a kiln is, we do not know, but if the sensible heat of the lime is recovered and returned, if kiln rotation of fifty seconds is possible, if the pitch of the kiln is right and an ample amount of stone can be fed, if the pulverizer has the capacity to grind the coal and the kiln has the draft to take the gases away, then we would say the upper limit will be close to 250 tons, which may on the surface be startling, but need not be, if we remember that the heat in discharging hot lime represents the heat necessary to make 70 tons more lime.

Output Rather than Efficiency Is Needed

Such a forced operation may not give the highest fuel ratio, terminal temperatures will be much higher, loss due to incomplete combustion will be higher, but lime will be made when lime is needed more than it ever was, or ever will be needed again, perhaps. It will be made for the same overhead, with practically the same operating force, except for the quarry, it will be definitely cheaper lime, with the additional advantages to the country that steel of new plants will be saved and that future competitive troubles with these same new plants may also be avoided.

In those plants where natural or producer gas already is available, much can be accomplished for very little, but where not, it is not quite so simple. In such cases the illustration shows the way out.

The kiln shown was specially designed for the present era and is an outgrowth of many before it; it has the least steel and refractory for the amount of shaft area, the simplest foundation, the whole to be built at the lowest possible cost, considering capacity. The 56 sq. ft. shaft should give 50 tons of lime with reasonably sized stone; the adjacent gas producer should be instrumental in securing a fuel ratio of 5 to 1. Such kilns could be built quickly and cheaply and new shells would perhaps not be necessary.

YOURS FOR LOW-COST PRODUCTION

Union-Formed Wire Rope

Because **Union-Formed** (pre-formed) Wire Rope is free from internal stress, it is much slower to fatigue under the combined stresses of constant bending. In service over small sheaves or wherever bending is severe, **Union-Formed** will far outlast ordinary rope and effect a real money saving. Write or wire.

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The "ULTIMATE LOW COST WIRE ROPE"

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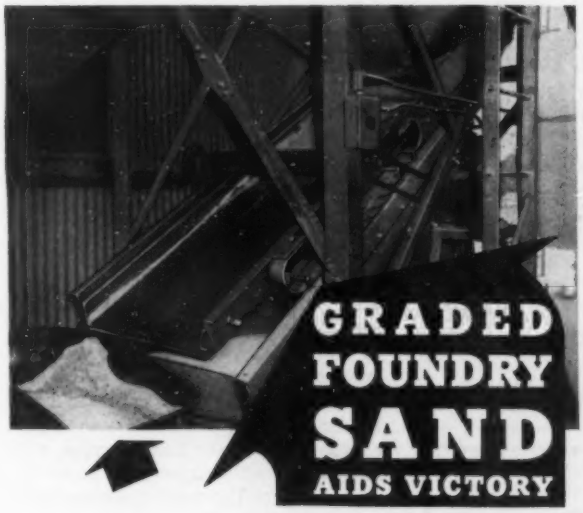
5-42



GRADED FOUNDRY SAND AIDS VICTORY

● Whitehead Brothers' new plants at Dividing Creek, N. J., are producing high quality, precision-sized foundry sand. Among other Link-Belt equipment in operation are two vibrating screens, which eliminate lumps in sand coming from dryers. Efficiency and economy of operation are features of Link-Belt sand and gravel preparation equipment.

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WRITE TODAY! **LINK-BELT Vibrating Screens**

MOLEHILLS OUT OF MOUNTAINS *Quicker*

Faster—because Blaw-Knox buckets handle more pay load with less dead weight. And Blaw-Knox buckets have many such superior structural features as the rigid head to maintain cable alignment, prevent wear—and sealed ball-bearing sheaves in the lever arm to improve operating efficiency.

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BLAW-KNOX BUCKETS

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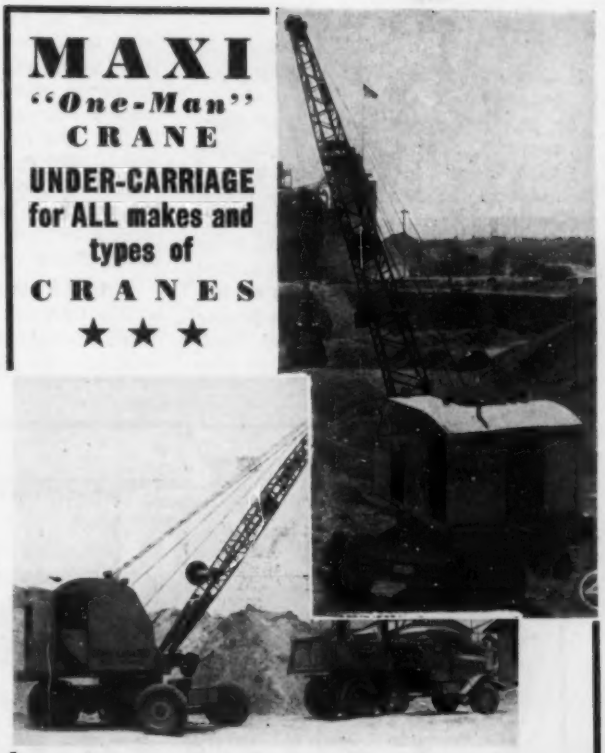
Farmers Bank Building, Pittsburgh, Pa.

MAXI
"One-Man" CRANE
UNDER-CARRIAGE for ALL makes and types of CRANES

★ ★ ★



TOP: MAXI "One-Man" operated Crane Carriage, rehandling aggregate for a large sand and gravel concern. 60 foot boom with one yard clam-shell. All controls operate from cab in ANY position.

BOTTOM: Large sand and gravel pit operators find that the MAXI "One-Man" Crane Under-carriage serves them well in war-time emergencies where peace-time economies and top production also are a vital factor.

STREAMLINE YOUR PRESENT CRANES —TO MEET WAR-TIME DEMANDS!

Now, more than ever, when SPEED and increased PRODUCTION are vital to our National Defense—MAXI "One-Man" operated Crane Under-Carriages are right on the job, in the front lines, as all America digs in!

Help conserve man-power. Streamline your Cranes NOW!

ECONOMICAL SAFE • SMOOTH and SPEEDY

An ideal combination. Short turning radius for maneuverability in small or crowded places, large tires and Air Brakes for stability, traction and safety. Save TIME and MONEY. Buy a MAXI "One-Man" operated Crane Under-carriage. IT PAYS BIG DIVIDENDS!

OTHER "MAXI" PRODUCTS

FOUR WHEEL DRIVES
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FRAME AND WHEEL BASE ALTERATIONS • LUMBER ROLLS • AUXILIARY TRANSMISSIONS • SPECIAL LITEWEIGHT DUMP BODIES
HYDRAULIC HOISTS
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DESIGNING • DEVELOPING MANUFACTURING SPECIAL UNITS OF ALL KINDS
"TRI-PULL" TRACTORS AND "MAXI" MUCK MOVERS

■ Conserve your present equipment. Modernize your Cranes to obtain longer service and greater production. Write for illustrated Bulletin "CU-8-42" — NO OBLIGATION.

SIX WHEELS INC.
MANUFACTURERS & ENGINEERS
1550-1584 EAST 20th St. PRospect 3141
LOS ANGELES, CALIF.

Calcination

(Continued from page 58)

tenance which is no negligible element of cost.

Table II shows the thermal efficiencies of a rotary kiln burning lime with various fuel ratios for bituminous coal of 13,500 B.t.u. per pound heating value.

With large kilns coming into favor for the production of lime, this matter of thermal efficiency becomes an important factor in choosing the proper size mill to pulverize the coal. Such a kiln capable of producing 150 tons of lime per day with a coal ratio of 2.22 to 1 must, with a direct firing unit pulverizer, have equipment and power to pulverize about 5600 lb. of coal per hour. With a fuel ratio of 4 to 1 the fuel requirement is only about 3200 lb. per hour. Thus beside the direct saving in operating expense, there would be considerable saving in first cost, since a smaller direct firing unit can be used.

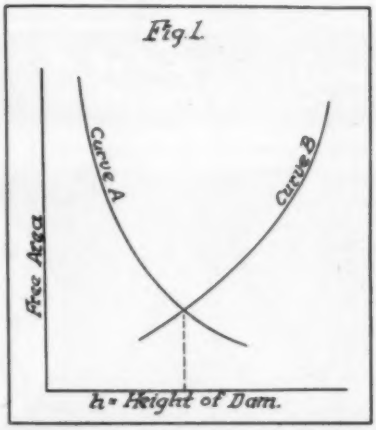
Rotary kilns can be operated most efficiently when producing their optimum normal capacity. Frequently the kiln must be operated at reduced capacity because of limited sales or storage capacity.

Shut-downs, especially of short duration, are costly. The refractory lining in particular suffers. Fuel costs rise because during the "heating up" period even more than normal quantities of fuel are used and production is negligible.

Consequently, unless a protracted shut-down is indicated, attempts usually are made to keep the kiln operating at reduced capacity. Regardless of the method of attaining this result, the thermal efficiency will be reduced by reason of the fact that the normal heat losses remain fairly constant, especially that through the kiln shell, and thus become larger in proportion to the total heat involved in the process.

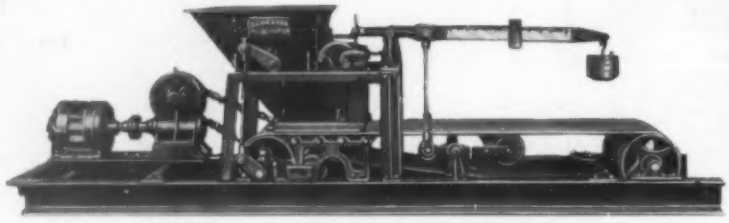
Fuel Preparation

COAL.—The cost of coal delivered to the plant is generally used in computing the fuel cost of the finished material. As a matter of good practice the cost of fuel should be based upon delivery into the kiln. In the former case only the thermal cost of the fuel is being considered. In the latter case the total cost picture is presented and thus becomes subject to study and analysis.



Curves plotted to determine optimum height of material dam at feed end of kiln

Coal as fuel cannot be used as received in the shipping container. In some instances it is dried, pulverized, and the finished product stored in bins prior to use. In most cases, however, it is sized, stored in bins, and pulverized just prior to its delivery into the kiln. This latter system is coming into great favor which is justified by improved safety conditions and by greater economy of labor and means. Furthermore, the unit system of direct firing, with most coal pulverizing units, provides a fairly



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For Speed and Accuracy In Proportioning Materials

The pressure of wartime production places special importance on speed and accuracy. In the proportioning of materials the Schaffer Poidometer guards these factors with unvarying exactness. With its use no proportioning errors can creep in to upset the uniformity or cause variation of the mix.

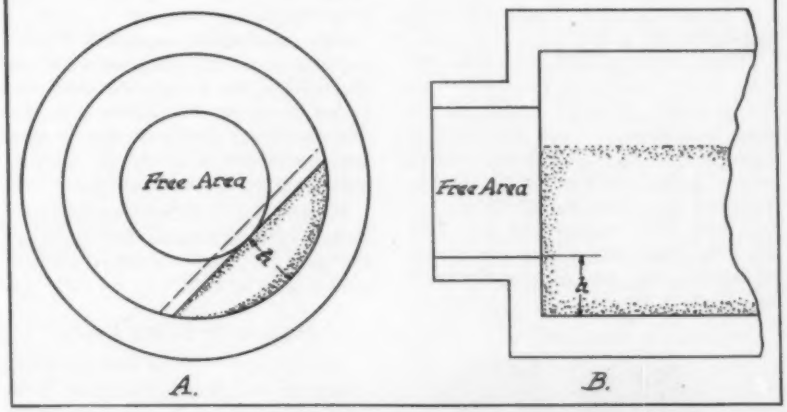
Schaffer Poidometers are sturdily built to take the punishment of sustained high speed.

If you have a proportioning problem—raw or finished materials—write for Catalog No. 2

SCHAFFER POIDOMETER CO.

2828 Smallman St. Pittsburgh, Pa.

Fig. 2.



Illustrates the relation of material dam in kiln and the free opening or free area

constant flow of fuel as well as means of immediately changing this flow-rate at will.

In order that the pulverizing unit be assisted in its task of delivering a constant supply of fuel to the kiln, it is advisable to provide it in turn with properly sized coal. To have very coarse coal fed to the pulverizer one time and very fine coal the next can only result in irregular delivery of pulverized coal to the kiln. By making the supply of coal to the pulverizer more uniform in size, the delivery of the finished material to the kiln will be more uniform in quantity and quality.

There are several good coal pulverizing units available to-day. In selecting such a unit, there are many factors to be considered before the proper unit can be finally chosen. First, of course, is the determination of the quantity of fuel required per unit of time. Secondly, the grindability of the particular coal to be used should be known since this factor affects the capacity of the pulverizing unit. Thirdly, the power required to drive the mill and accessories should not be excessive. Fourthly, those parts of the mill subject to wear and replacement should be thoroughly studied with regards to maintenance.

Most unit pulverizers now provide means for drawing hot air through the unit to affect drying of the wet coal as it is pulverized.

Those in which tramp iron proves harmful are generally provided with various magnetic and trap arrangements to keep such material from entering the grinding compartment.

Comparatively recent developments in connection with the tube or ball mill render it a particularly effective, easily handled, direct firing unit. In the "good old days" a ball mill of more than ample size was provided and the quantity of fuel delivered to the kiln was controlled by the amount of coal fed into the mill. Thus there was a considerable delay or time lag between the time the change was made until equilibrium grinding conditions were attained in the mill. This is to say nothing of achieving the

Made of Acid Open Hearth Steel Wire

Round Strand
Flattened Strand
Preformed
Steel Clad
Non-Rotating

The Service Record of this wire rope continues to make and hold friends.

MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
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Prevent BURN-OUTS at both KILN-ENDS

The use of PYRASTEEL Kiln Ends is not by any means confined to the *discharge end.*

Such high temperatures are frequently encountered at the *feed end* of the kiln, as to make the use of

PYRASTEEL SEGMENTS

the most practical method of preventing *burnouts* and interrupted operations.

There are many PYRASTEEL installations on the *feed end* and on the *discharge end* of rotary kilns . . . also where both the feed and discharge ends are provided with PYRASTEEL Segments. All are giving satisfactory results.

Write for Bulletin on this Heat-Resisting Alloy

CHICAGO STEEL FOUNDRY COMPANY
KEDZIE AVE & 37TH ST
PYRASTEEL for high temperatures — CHICAGO Makers of Alloy Steel for 30 Years — EVANSTEEL for strength

delicate adjustment needed for proper combustion and so poorly provided by the usual table-type feeder.

The properly proportioned ball mill carries a reserve supply of fuel while it is operating, thus permitting ample time for grinding as well as allowing ample time for the hot air to dry the coal if it is wet. Tramp iron is not detrimental and no special provisions are necessary for its entrapment and removal. With present available controls, a fixed level of coal can be constantly maintained in the mill, thus assuring maximum coal pulverizing effectiveness and minimum wear on the mill liners. Maintenance costs are thus held to a minimum. The power required to drive the well-designed ball mill unit and its accessories is low.

With this automatic control of the coal level in the mill, the control of fuel quantity delivered to the kiln is extremely sensitive, and the delicate balancing of the combustion process can be quickly and easily performed. Primary air quantities can be closely regulated and changed at will and thus the characteristics of the flame of the burning fuel can be modified to a certain extent.

COLMONOY SAVES VITAL METALS

The Pug Knives shown above tell a graphic story of the unusual wear resisting qualities of COLMONOY hard-surfacing alloys and overlay metals.

1. New, 25 lb. pug knife, made of high alloy steel.
2 and 3. Same type, after only 3 months of service. Worn beyond efficient operation, with loss of over half of blade material.
4 and 5. Same type. Each blade coated with 1½ lbs. of COLMONOY No. 6. In constant use for over a year, and still operating efficiently.

COLMONOY alloys are playing a vital part in the Rock Products industry. Use them on parts subject to great wear—drag buckets, dipper teeth, hand shovels, conveyor screws, gudgeons, pulverizing hammers, clinker plows and other parts that have tough going.

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COLMONOY
Hard Surfacing Alloys and Overlay Metals

OIL—The cost of the preparation and delivery of oil fuel to the kiln is largely that of providing steam or air for atomization.

GAS—Because of the cost of installing and operating gas producers and the serious loss of sensible heat between the producer and the kiln, the cost of using producer gas as fuel for the rotary kiln will be high as compared to bituminous coal.

Natural gas is an excellent fuel for rotary kiln operations, but for most purposes its cost is excessive and excludes it as a fuel.

Method of Firing Fuels

The method of using fuel in rotary kilns, odd as it may seem, is not fixed. There are those who advocate maintaining a constant flow of kiln load or burden (constant kiln speed) and regulating the fuel to suit the burning of the material. Others vary the load or burden of the kiln as well as regulating the fuel. Undoubtedly the best way to operate the kiln is to fire the greatest quantity of fuel possible under conditions of balanced combustion, and vary the speed or turns of the kiln in such a manner as to get the most possible satisfactory material out of it.

If it will be remembered that either excess air or excess fuel causes a waste of heat, then all endeavors will be directed toward maintaining conditions closely approaching balanced combustion at all times. Thus we will be carrying on the combustion process itself in the most efficient manner available to us.

The rotary kiln is operating at its maximum over-all efficiency when it is producing some certain optimum quantity of suitable finished material with the least amount of fuel possible under the existing conditions and arrangement of equipment. If the fuel is being burned under conditions of balanced combustion, there is nothing further that can be done to improve this part of the process. Under the conditions of burning thus prevailing, various quantities of the finished product can be made. Attempts to produce excessively large quantities of the product will result in poor quality, either because the material was not subjected to a sufficiently high temperature, or not allowed sufficient time for the reactions to be completed. On the other hand, when too small quantities are produced there are difficulties because the material is over-processed. Consequently somewhere between these limits of producing under-processed and over-processed material there is an opti-

mum production rate at which the kiln is working most efficiently. The ultimate task, therefore, is to burn the fuel under conditions of balanced combustion and maintain as closely as possible those conditions regulating the flow of material through the kiln at the optimum rate. The most convenient way of performing this latter is by regulating the rotation of the kiln.

A simple empirical relation developed by the writer to predict the approximate economical production capacity of rotary kilns is given below.

$$T = \frac{kD^2L}{100}$$

in which

T is the tons produced per day.

D is the diameter of the kiln shell, in feet.

L is the length of the kiln in feet.

k is a constant, its numerical value depending upon the kind of material being produced.

No claim for great accuracy is made for this simple relation, especially when L is greater than 300 ft. Nevertheless it serves its purpose in predicting within practical limits the optimum rate of kiln production.

Fuel and Depth of Load or Burden

Another feature of the rotary kiln of great interest because of its relation to the general problem of burning the proper amount of fuel for best results has to do with the depth of the load or burden of the kiln.

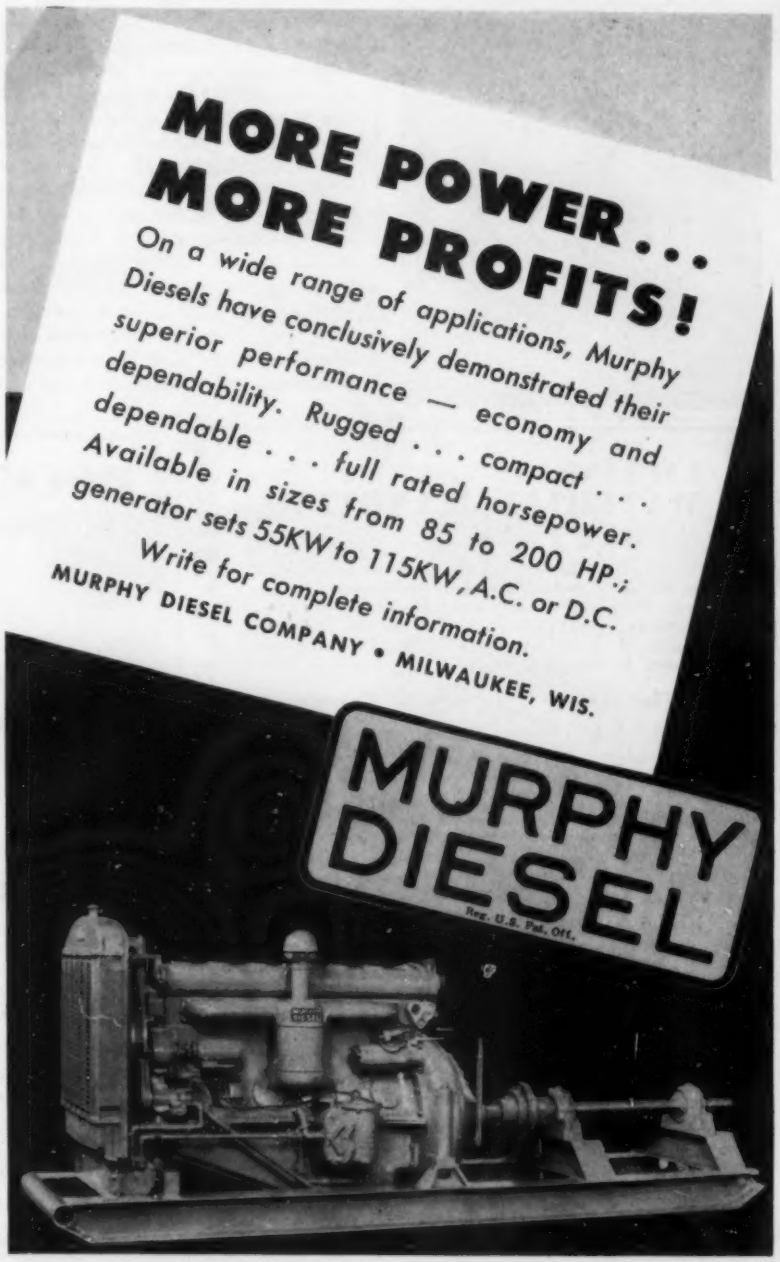
Ordinarily there is a retaining dam at the feed end of the kiln which serves two purposes. The major purpose is to retain a fixed depth of load in the kiln. In addition to this, however, it affords a restriction in the path of the gases leaving the kiln, and thus affects the fuel-burning capacity of the system. As this dam is made higher, the load of the kiln becomes greater, but the opening becomes smaller and the ability to burn fuel under conditions of balanced combustion and under identical conditions of draft is decreased. In order to determine the optimum height of this dam, we have simply to plot the two curves shown in Fig. 1. Fig. 2 illustrates the relation of the dam and the free opening or free area.

The curves are based upon two assumptions: first, that under conditions of balanced combustion and identical draft, the fuel burned is proportional to the free area at the feed end of the kiln; second, that the fuel requirement of the load is directly proportional to the area of the segment of height "h."

The curve A is the result of plotting the value of the free area against the height of the segment. This relates the fuel-burning capacity of the arrangement to the height of the dam. Curve B is developed from the area of the segment of height "h" and the free area proportional to it. Since the area of the segment represents the quantity of material per unit length of the kiln it therefore represents also the heat required. Thus curve A relates the heat that can be produced or developed and curve B relates the heat that is required, to the common factor of the load depth. The point at which these two curves intersect shows the optimum height of the dam.

Length of Flame

In the rotary kiln heat is transferred to the load of the kiln by the three possible means of heat transmission, namely, radiation, convection, and conduction. Toward the feed end of the kiln the heat is largely transferred by convection and conduction. The hot kiln gases, of low luminosity, heat the kiln wall and load largely by convection, as they travel toward the gas outlet of the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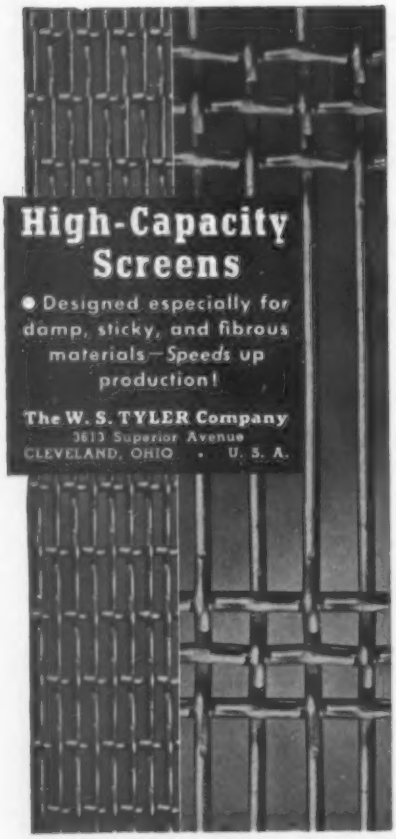
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kiln. Since the kiln wall is exposed to the hot gases for a greater period of time than the average load particle, the kiln wall is at a higher temperature than the load, and as the particles roll upon themselves and finally rest upon the hotter kiln lining during the oft repeated cycle of travel they become heated by conduction.

In the vicinity of that portion of the kiln wherein the actual combustion of the fuel is taking place, enormous quantities of energy in the form of heat are being released through the medium of flame, the nature of which is yet only superficially understood. This released energy is transmitted to the walls of the kiln and the load surface at a rate proportional to the 4th power of the absolute temperature and received with an intensity inversely proportional to the square of the distance between the flame and the receiving surfaces.

A long, rolling, "soft" flame is totally different from a short, snappy, "hard" flame. In the case of the former, the net result is a lengthening of the zone in which most of the heat is being transmitted by radiation, and it is at a lower temperature level than the equivalent zone wherein a "hard" flame is maintained. In the case of a hard flame, the high temperature zone is hotter and of shorter length.

The explanation for this is quite simple. Let us assume that we are burning bituminous coal in a rotary kiln at a rate of 50 lb. per minute and conditions are such that there are 15 ft. from point of ignition to tip of flame. With a coal of heating value 13,500 B.t.u. per lb. there is a release of 675,000 B.t.u. per minute or 45,000 B.t.u. per minute per foot of flame. Now, by lengthening the flame to 25 ft. from point of ignition to tip without changing the rate of firing fuel, we have only 27,000 B.t.u. per minute per foot of flame. Thus the heat of combustion given off as radiated heat, being distributed over a larger surface, results in that surface receiving the energy reaching equilibrium at a lower temperature level.

There are advocates of the long flame and of the short flame. It is doubtful that either one flame-type will serve the innumerable materials being processed in the various rotary kiln operations. As an example, lime is easily overburned if subjected to too high a temperature for too long a time. On the other hand, clinkered or dead-burned refractories must be heated to high temperatures.

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TRAFFIC NEWS

Recent Rate Changes

Following are the latest proposed changes in freight rates up to and including the week of Oct. 24

Southwestern

28878. **Tripoli**, Butterfield and Hot Springs, Ark., to destinations in Official and Eastern territories. To establish the Class 16 rating on tripoli, crushed or ground, min. wt. 60,000 lb., from Butterfield and Hot Springs, Ark., on the C. R. I. & P. to Official and Eastern territories, by amending Note 2, Section 2, Item 1572A of S. W. L. Tariff 252A, to include Butterfield and Hot Springs, Ark., as origin points.

29424. **Silica sand**, Hermann and Pacific, Mo., to points in the Southwest. To establish the following commodity rates in cents per net ton on silica sand, carload, in box cars (See Note 2), from Hermann and Pacific, Mo., to:

To	From Hermann, Mo.	From Pacific, Mo.
Waco, Tex.	323	332
Palestine, Tex.	336	336
Dallas, Tex.	309	318
Caney, Kan.	215	239
Ft. Smith, Ark.	255	255
Fredonia, Kan.	228	240
Henryetta, Okla.	253	264
Independence, Kan.	215	227
Joplin, Mo.	185	198
Muskogee, Okla.	227	239
Okmulgee, Okla.	253	264
Sand Springs, Okla.	240	252
Sapulpa, Okla.	240	252
Tulsa, Okla.	240	252
Shreveport, La.	316	308

29432. **Limestone**, Valmeyer, Ill., and Prairie du Rocher, Ill., to El Paso, Tex. To publish on ground or crushed limestone rate of 519c per net ton (See Note 2), from Valmeyer and Prairie du Rocher, Ill., to El Paso, Tex.

29497. **Crushed stone and crushed or pulverized limestone**, between points in Southwestern and Western Trunk Line territories. To clarify paragraph (b) of Item 60, S. W. L. Tariff 162R, and Item 20, W. T. L. Tariff 237D, so that the application, crushed stone and crushed or pulverized limestone will be clear as to applying in bulk in covered hopper cars.

29518. **Mineral wool (rock or slag wool)**, Joplin, Mo., to points in Official territory. To establish in S. W. L. Tariff 252A, Class 27½ rating on mineral wool (rock or slag wool), metal reinforced, minimum weight 30,000 lb., subject to Rule 34, from Joplin, Mo., to points in Official territory.

Note 1—Minimum weight marked capacity of car.

Note 2—Minimum weight 90% of marked capacity of car.

Note 3—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

Note 4—Reason: No present or prospective movement.

Note 5—Reason: Comparable with rates from other origins in immediate vicinity.

Note 6—Rates will not apply on shipments in cars with tarpaulin or other protective covering. In such instances the rates applicable on shipments in box cars are to be assessed.

Note 7—The oil, tar or asphaltum not to exceed 10% of weight of the commodity shipped, the shipper to so certify on shipping order or bill of lading.

Trunk

Sup. 1 to 41029 (shippers). **Limestone**, other than ground or pulverized, C. L. (See Note 3), from Devault, Penn., to Nichols Siding, N. Y., $2.71 per gross ton, in lieu of current 6th Class rate.

Sup. 1 to 41041 (shippers). **Limestone**, crude, fluxing, foundry and furnace, when shipped in open top cars, C. L. (See Note 3), from Lebanon Valley District, viz.: Annville, Myerstown, Palmyra and Swatara, Penn., also Cavetown, Md., and Thomasville and Bittinger, Pa., to Newton Falls, O., $1.62 per gross ton in lieu of current rate of $1.79 per gross ton.

41087 (shippers). **Fluorspar** in packages or in bulk, C. L., ex-river, min. wt. 40,000 lb., from:

Points in the Pittsburgh District, viz.: Aliquippa, Penn.; Allegheny (Pgh. North Side), Penn.; Bessemer, Penn.; Colona, Penn.; Etna, Penn.; Glassport, Penn.; Glenwood, Penn.; Hays, Penn.; Jct. Tfr. (33rd St. Sta., Pgh.), Penn.; McKeesport, Penn.; Mifflin Jct., Penn.; Munhall, Penn.; Munhall (Kenny Yard),

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Penn.; New Kinsington, Penn.; Pittsburgh, Penn.; Rankin, Penn.; Rochester, Penn.; South Duquesne, Penn., to Baltimore (Sparrows Point), Md., $3.96 per net ton in lieu of current 6th class rate of 24c per 100 lb. Reason: Comparable with rates from and to other points.

41121 (increase) (carriers). (A) **Sand** (industrial), and **gravel** in open top cars without tarpaulin or other protective covering, and (B) **sand**, naturally or otherwise bonded molding and **gravel** in open top or closed cars, and **sand** (other than ground or pulverized) and **gravel**, in closed cars, C. L. (See Note 3), from Ridgway, Penn., to Point Au Pic, Que.

(A) $4.40 and (B) $4.84 per net ton. Reason—To place rates on a proper basis.

41136 (shippers). **Limestone**, broken, crushed, ground or pulverized, C. L., min. wt. 60,000 lb., from Montrose, and New Hamburg, N. Y., to Wye Mills, Md., $2.59 per net ton, in lieu of current sixth class rate. Reason: (See Note 5.)

41137 (shippers). **Crushed stone** and **crushed stone screenings**, C. L. (See Note 3), from Auburn, N. Y., to Hayts Corners, N. Y., 62c per net ton in lieu of current rate of $1 per net ton. Reason: (See Note 5.)

41160 (increase—carriers). To cancel all rates on **crushed stone** with or without coating of oil, tar and/or asphaltum, C. L., from Jamesville, N. Y., and Rock Cut, N. Y., to Rutland R. R. stations indexed 5, Ogdensburg, N .Y., to 115, Champlain, N. Y., inclusive, as published in Commodity Rate Group 301, of D. L. & W. R. R. Tariff I. C. C. 24006. Reason: (See Note 4.)

Illinois

IRC 3339-17-A—**Stone**, crushed, coated with oil, tar or petroleum (known as amiesite or carbo rock), **gravel** and/or sand, coated or treated with oil, tar or asphaltum, C. L. (See Note 3). To establish rate of $2.83 per net ton from Chicago, Ill., to Venice, Ill.

IRC 4231-5-E—**Roasted dolomite**, C. L. (See Note 3), but not less than 60,000 lb. will apply, from Chicago, Ill., to Sterling, Ill. Present, $1.63 net ton. Proposed, $1.80 net ton. Meeting, Sept. 9, 1942, 10 a. m.

IRC 7497-39. **Limestone, crushed or ground**, C. L. (See Note 3), but not less than 60,000 lb., from Prairie du Rocher, Ill., to Marseilles and Ottawa, Ill. Present: $2.26 per net ton. Proposed, $2.05 per net ton, subject to Ex Parte 148 increases. Meeting, Sept. 9, 1942, 10 a. m.

IRC 9469. **Sand, moulding**, C. L. (See Note 3), Hamilton, Ill., to Moline, Rock Island, Ill., and Davenport, Ia. Present, 14c per 100 lb.; proposed, $1.31 net ton (includes Ex Parte 148 increases). Meeting, Sept. 9, 1942, 10 a. m.

IRC 7497-40. **Limestone**, crushed or ground, C. L. (See Note 3), but not less than 60,000 lb., from Prarie du Rocher, Ill.

(Rates per net ton)

To	Pres.	Prop.
Chicago, Ill.	$2.26	$2.05
Milwaukee, Wis.	3.25	3.04

Subject to Ex Parte 148 increase.

IRC 7497-41. **Stone**, crushed, ground or broken and strippings of stone quarries, straight or mixed C. L. (See Note 3), but not less than 40,000 lb.:

From Valmeyer, Ill.

To	Pres.	Prop.
St. Louis (M. P. Del.)	(1)79	(1)75
St. Louis (Term. Del.)	(2)75	(2)75
Carondelet	(1)79	(1)75
St. Louis (I. T. Del.)	(3)69	(3)69
St. Louis	(1)75	(4)70

From Prairie Du Rocher, Ill.

St. Louis (M. P. Del.)	88	(1)81
St. Louis (Term. Del)	95	(2)81
Carondelet	88	(1)81
St. Louis (I. T. Del.)	Com.	(3)75
St. Louis	88	(4)76

(1)Applies only via Mo. Pac. and Municipal Bridge for deliveries in St. Louis switching limits.

(2)Applies only via Mo. Pac., Dupo, Ill., Term. R. R. deliveries and connections.

(3)Applies only via Mo. Pac., Dupo, Ill., or Valley Jct., Ill., A. & S. R. R., A. & S. R. R. or Term. R. R. Assn. of St. Louis, E. St. Louis and Ill. Term. via McKinley Bridge.

(4)Applies only via Mo. Pac. and Municipal Bridge to connections in St. Louis.

ORMV 8296-1. **Limestone**, ground or pulverized, unburnt, C. L., min. 60,000 lb.

To Owensboro, Ky.

From	Pres.	Prop.
Valmeyer, Ill.	237	226
Prairie du Rocher, Ill.	237	215

To Taylorville, Ky.

From	Pres.	Prop.
Valmeyer, Ill.	307	270
Prairie du Rocher, Ill.	307	270

Rates in cents per net ton, subject to Ex Parte 148 increases. Meeting Sept. 22, 1942, 10 a. m.

IRC 9339-A. **Moulding sand**, C. L., usual min. wt., from Savanna, Ill., to Decatur, Ill. Present rate—Class rate. Proposed rate—$1.53 per net ton.

IRC 9471. **Stone**, viz.: Crushed, broken, etc., as described in Item 20, I. C. R. R. Tariff 13321-I, Ill. C. C. A-1572 (See Note 3), from Chicago and Hillside, Ill., to Anna, Ill. Present: $2.22 net ton. Proposed: $1.99 net ton. Subject to Ex Parte 148 increases.

Central

71497. **Sand, all kinds, and gravel**, in open top cars, C. L. Establish on, from Perrysville, O., to various points in Ohio, rates as shown below, subject to Ex Parte 148 increase, via usual available routes.

Proposed rates, in cents per net ton, to representative cities in Ohio: Akron, 99; Alliance, 110; Ashland, 83; Atlas, 116; Barberton, 94; Bellaire, 138; Bellefontaine, 116; Berea, 110; Bucyrus, 66; Canton, 99; Chagrin Falls, 116; Chillicothe, 138; Cincinnati, 160; Cleveland, 116; Columbus, 110; Coshocton, 94; Dayton, 138; Delphos, 127; Deshler, 116; Findlay, 110; Fostoria, 105; Fremont, 110; Galion, 77; Gallipolis, 160; Greenville, 138; Hamilton, 149; Ironton, 182; Jackson, 149; Leetonia, 116; Lima, 116; Louisville, 105; Marietta, 138; Marion, 94; Massillon, 94; Middletown, 138; Mt. Vernon, 66; Newcomerstown, 99; New Philadelphia, 110; Niles, 127; Piqua, 138; Plymouth, 83; Pomeroy, 149; Portsmouth, 160; Ravenna, 110; St. Marys, 127; Sandusky, 105; Shelby, 77; Steubenville, 127; Tiffin, 99; Toledo, 116; Troy, 138; Van Wert, 138; Wapakoneta, 127; Xenia, 138; Youngstown, 127; Zanesville, 110.

71509. **Crushed stone**, in open top cars. Establish on, from Middlepoint, O., to Hayden Siding, Ind., 94c per net ton, subject to Ex Parte 148.

71552. **Fluorspar** in packages or in bulk, C. L., min. wt. 40,000 lb., ex-river. Establish on, from pts. in the Pittsburgh Dist., viz.: Aliquippa, Allegheny (Pgh. North Side), Bessemer, Colona, Etna, Glassport, Glenwood, Hays, Jct. Tfr. (33rd St. Sta., Pgh), McKeesport, Mifflin Jct., Munhall, Munhall (Kenny Yard), New Kensington, Pittsburgh, Rankin, Rochester and South Duquesne, Penn., to Baltimore (Sparrows Point), Md., 396c per net ton, subject to Ex Parte 148 increase, via usual routes.

71569. **Sand** (industrial or **gravel**, in open top cars, C. L. (See Note 3). Establish on, from Marion, Ind., to Hayden Siding, Ind., 99c per net ton, subject to Ex Parte 148 increase, via N. Y. C. (C), Wabash, Ind., Wab. R. R.

71628. **Sand, all kinds, and gravel** in open top or box cars, as described in N. Y. C. Sys. Trf. 1914. Revise rates on, from Silica, O., to Cleveland, O., to be 116c in open top cars only and 133c per net ton in box cars only, via reasonable direct routes, subject to Ex Parte 148 increase.

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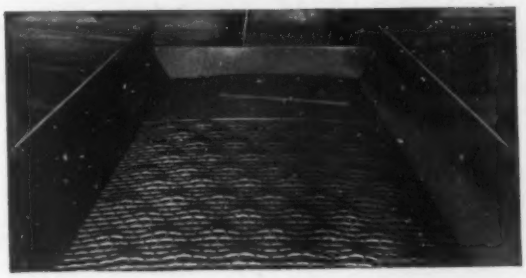

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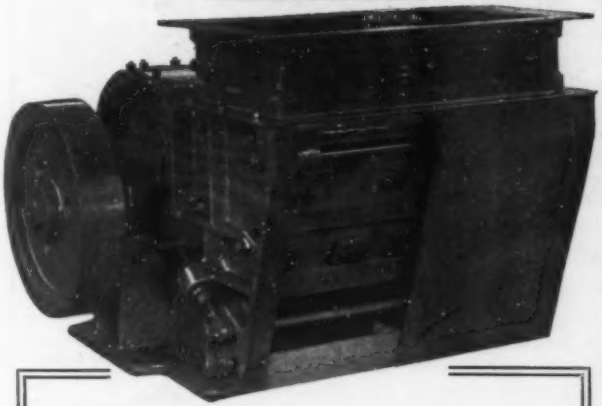

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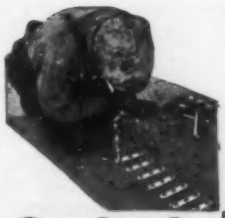

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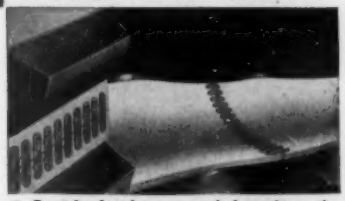

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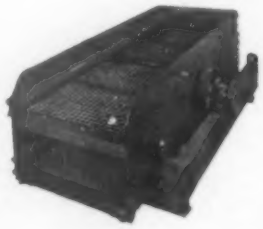

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Chemists' Corner

(Continued from page 56)

sample. One hydrometer may be used for as many analyses as the operator can perform expediently and all may be carried to completion, whereas a separate pipette is required for each analysis.

The Wagner turbidimeter method has not been found satisfactory for general particle size analysis. However, its attributes of speed and relative simplicity require that it be considered for control work where some knowledge of the optical properties of the suspensions being studied are available. This method has been found to be satisfactory for silica down to 1.25 microns.

A. The Pipette Method

In this method the weight distribution is determined by direct weighing of the residue from a pipetted sample. The diameter of the particles remaining in suspension is computed from the direct measurement of the height of fall. The apparatus used is the Andreasen pipette (5) or the special pipette for rapid analysis illustrated in Fig. 1.

1. *Procedure*

(a) Preparation of sample:

A dried sample or sample containing a known dry weight sufficient to give a 1 or 2 percent suspension is used for materials of density equal to about 3 grams per cc. If the material is of higher density, a proportionately larger concentration should be used, but if it is of lower density, a 2 percent suspension is sufficient to obtain precision in the low concentrations at small diameters. The density if not known should be run by the ASTM Method or any other method of equal precision. The viscosity of the suspending medium should be determined preferably by the ASTM Tentative Method.[3]

(b) Dispersion:

A stock dispersing solution containing 10 grams of sodium metasilicate ("Metso Granular") per liter of distilled water should be made. Forty ccs. of this stock solution is added to the sample in a 600 cc. beaker and allowed to stand a few minutes. The volume is then made up to about 500 ccs. with distilled water. The beaker and contents are then placed under the stirring apparatus (Fig. 2) and sufficient water added to cover the top of the stator. This apparatus is similar to the one described in the ASTM Tentative Method[4] using a motor speed of 3000 to 4000 r.p.m. except that it is modified by encasing the propellor in a perforated brass stator. This stator aids in producing shearing action and prevents any swirling motion which does not give good dispersion. The rotor should be close enough to the bottom of the beaker to prevent any dead spots, especially when using dense materials, and the liquid level should be above the rotor to a sufficient height to prevent the rotor from pulling air into the suspension. The time of dispersion should be 15 minutes and the suspension washed into the pipette cylinder. When the pipette head is inserted, the level of the suspension rises and accordingly distilled water is added to bring the level to a reference mark after the pipette head is inserted. This level (bottom of meniscus) becomes the starting level mark for every analysis and determines the starting volume of suspension for subsequent calculations. The pipette tubes should be empty and the stopcock closed when the pipette is inserted.

All dimensions of the pipette necessary for computation should be obtained by calibration, and for best results the pipette and distilled water should be brought to the test temperature before starting.

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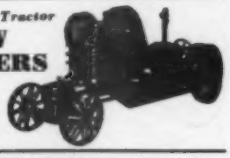

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(c) Test Procedure:

Rubber tubing containing a glass tube of fine bore for a mouthpiece is attached to the pipette and the apparatus assembled after dispersion. The level may be raised to the mark by adding water through the breather hole. With the breather hole closed by the finger the entire assembly is given an end over end motion. At the exact time that this motion is stopped the time is noted and the assembly placed in the constant temperature bath and clamped to a ringstand to prevent disturbance during the sampling manipulations. The constant temperature bath should be thermostatically controlled and may be of similar construction to that in the ASTM Tentative Method of Test[4] and of sufficient depth to surround the pipette body for 2 to 3 cms. above the starting level mark.

At the exact time intervals samples are withdrawn as follows. (The proper time intervals to get a representative distribution curve will depend upon the density and the size distribution.) Since it takes about 15 seconds to siphon the sample, the midpoint of this interval should be used for calculating particle size. A continuous suction should be applied (by mouth) and the pipette filled after which the stopcock is closed and the fluid allowed to run immediately into a preweighed crucible held under the drainage spout. (Note: because of the construction of the stopcock proper manipulation must be used to prevent runback, but this technique is developed readily.) Pressure should be applied to blow out the sample at high velocity until the pipette is about half empty. At that time a slight suction should be applied to bubble air back through the drainage spout and the remaining sample, thereby washing the walls of the pipette; pressure is again applied and the remaining part of the sample blown out. In taking this sample care should be taken not to draw out more than the exact amount wanted and also that the stopcock is closed immediately after the sample reaches the mark on the pipette. Any pumping back and forth allows the coarse particles to settle out of the pipette. The drainage spout should be held against the side of the crucible to prevent splashing. After the pipette has been blown out, it should be allowed to drain for a few seconds and any further drainage blown into the crucible. The stopcock is then opened and the suspension allowed to seek its own level in the pipette tube. No other washing is necessary as any error caused by

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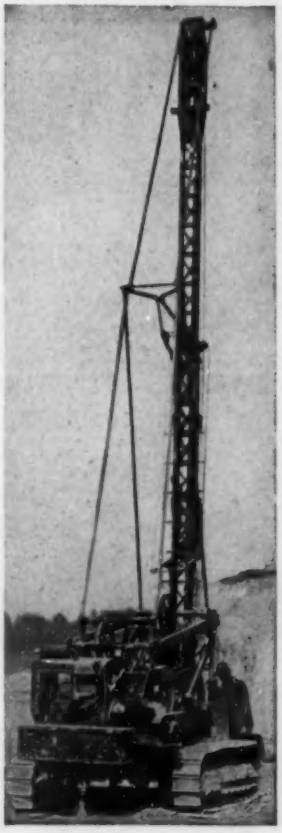

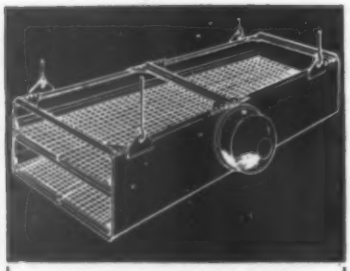

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adherence on the sides is well within the limit of experimental error for most materials.

For very fine materials the samples must be taken somewhat more slowly and carefully to prevent siphoning off of material below the pipette stem. The siphoning off of these particles for coarse materials has relatively little effect but for fine materials may give results showing more than 100 percent remaining in suspension.

The crucibles used for collecting the samples may be ordinary porcelain crucibles or Gooch crucibles with asbestos mats and suction filtering procedures may be used where there is present no material sufficiently fine to pass the mat. Fritted glass filters with proper technique might also be used for this purpose. The crucibles may be dried in an oven at any convenient temperature up to 140 deg. C. which requires from 1 to 2 hours depending upon the procedure used. For very rapid results platinum Gooch crucibles may be employed with the asbestos mat being dried over a direct flame before and after sampling. This method, however, is not suitable for materials containing volatile constituents or materials subject to decomposition at high temperatures. The crucibles should be weighed to the nearest 0.1 milligram.

Suggested sampling times for most materials and a 19 to 20 cm. starting height are 1, 3, 8, 30, 120, 480 and 1440 minutes. If the special pipette is used, the time for analysis is materially reduced since the same results can be obtained in 4 hours instead of 24. Sampling procedure for the special pipette is shown in the following tabulation.

Sample No.	Tube No.	Time Minutes	Diameter* Microns
1	I	1	53
2	I	3	30
3	I	7	20
4	II	15	10
5	II	45	5
6	III	60	2.5
7	III	240	1.25

*Actual diameter depends upon the particular liquid-solid system used. Refer to Eq. 2.

2. *Calculations*

(a) Measurement of Concentration of Particles Remaining in Suspension:

In this method the computation of the percent remaining in suspension, (G_c), after a given time is obtained by means of the following formula:

$$G_c = \frac{100 V_c w}{V_p W} = Kw \qquad (1)$$

where V_c is the volume of the suspension at the start, ccs.
w is the weight of dried material, gms, in a pipetted sample of V_p cubic centimeters
and W is the dry weight of the sample taken at the start, gms.

The constant K, for convenience in computing, may be made equal to 1000 by varying the weight of sample, W, according to the calibrated volumes of the pipette and cylinder.

(b) Calculation of Size or Particles Remaining in Suspension:

The size of particles remaining in suspension after time T, in minutes, from the start of the test is given by the following form of Stokes' Law.

$$d = \sqrt{\frac{307 \times n \times h}{(D_s - D_l) \times T}} \text{ microns} \qquad (2)$$

where d = equivalent spherical diameter
n = viscosity, centipoises
h = height of fall, cms.
and D_s and D_l are densities of the solid and liquid, respectively, gms. per cc.

The value of h for successive samples decreases and in any given pipette is fixed by calibration. That is, any consecutively numbered sample starting from the first one withdrawn is always the same height for the same consecutive sample in any other determination. Values for the density and viscosity of the suspending fluid described to be used in equation 2 are as follows:

Temperature °F	Density/4 D_s	Viscosity n
67	0.9986	1.00
72	0.9980	.95
77	0.9974	.90
82	0.9967	.85
86	0.9960	.80

3. *Interpretation of Results*

A plot of cumulative percent undersize versus log diameter allows interpolation of the amount below any size. If combined sieve analysis is used with pipette analysis, the point of separation for the No. 325 sieve data may be assumed to be 53 microns. This is 1.2 times the sieve aperture and the same relation may be employed for larger size sieves if desired.

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(4) A.S.T.M. Tentative Method of Test, D 422-40T.
(5) Andreasen, A. H. M., Kolloid Beihefte, 27, 349 (1928).

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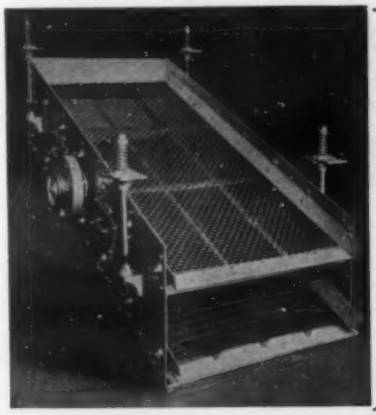

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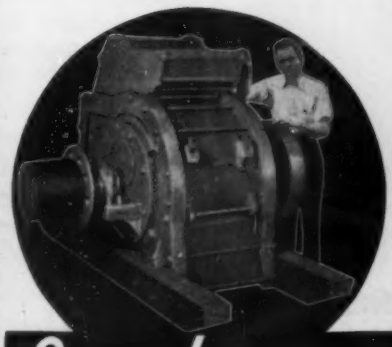

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OBITUARIES

Silica Pioneer Dies

EDWARD M. AYERS, dean of the silica industry and one of its most respected leaders, died on October 2 in his 79th year. His death followed a 13-week illness. Mr. Ayers' friendly

Edward M. Ayers

counsel will be missed at the meetings and conventions of the National Industrial Sand Association. He was president of the Ayers Mineral Co., the Millwood Sand Co., and the Central Silica Co. Mr. Ayers, who was born in Zanesville, Ohio, on August 2, 1863, was the son of a well-known Muskingum River steamboat captain. His education was received in the local elementary and high schools, and his early business activities included the execution of many successful paving contracts. It was not until 1884, however, that he started his career in the silica sand business which has expanded into ever-increasing markets until its business became almost world-wide in scope. He was also interested in a number of other business and financial institutions of Zanesville, and was a leading art patron, having founded the Zanesville Art Institute. Mr. Ayers was keenly interested in civic affairs, and was a director and vice-president of the Ohio Chamber of Commerce. He is survived by his wife, and four daughters.

Manufacturers' News

The B. F. Goodrich Co., Akron, Ohio, has the following announcements to make: L. H. Chenoweth, manager of manufacturers' sales, has resumed his duties after serving with the War Production Board in Washington; W. E. Williams has been appointed chief clerk of the Akron district office and Bert Schell to the belting sales department; R. E. Lewis, sales correspondent in the Akron offices, has entered the U. S. Navy as a chief petty officer in the physical training program headed by Gene Tunney; R. Burge, sales correspondent, New York district, is now in officers training camp; and O. B. Roberts, manager, Chicago district, has just completed 30 years of service with the company and has been presented his 30-year pin.

The Babcock and Wilcox Co., New York, N. Y., has been awarded the Maritime Commission "M" burgee in recognition of achievement at its Barberton works. The "M" burgee now flies alongside the Navy "E" burgee, which was awarded on May 11, 1942.

Roller-Smith Co., Bethlehem, Penn., announces that Roy M. Smith, formerly engineering manager for the wiring device division of the Bryant Electric Co., has joined the company as assistant chief engineer.

Worthington Pump and Machinery Corp., Harrison, N. J., announces the appointment of Mr. R. J. Laidlaw to the position of manager of its Cleveland district office, succeeding A. J. Klug who will now devote his entire time to special work. Mr. Laidlaw has been connected with the Worthington organization in various capacities since 1919.

Diamond Iron Works, Inc., Minneapolis, Minn., has appointed the Lincoln Road Equipment Co., Lincoln, Nebr., as their representative for the State of Nebraska.

Bailey Meter Co., Cleveland, Ohio, announces the appointment of L. F. Richardson as branch manager of its Los Angeles office, and H. T. Sawyer as branch manager of the Seattle office. These are newly established offices. Messrs. Richardson and Sawyer had previously been located in Los Angeles and Seattle but had functioned as representatives of the San Francisco branch office. V. A. Rumble, manager of the San Francisco office, continues as West Coast supervisor.

New Incorporations

Transit Mix Concrete Co., Manchester, Mass., has been incorporated with a capital of 100 shares, no par value. Incorporators are Louis Vassalotti and Frank R. Generazio, of Newton, Mass., John Kazanjian and Lucy Derderian, of Watertown, Mass.

Rock Mining Co., Biltmore, N. C., has been organized with a capital of $10,000. George A. Shuford, Jackson Building, Asheville, N. C., is the agent.

Gravel and Sand Operating Corp., Norfolk, Va., has been granted a charter, with a maximum capital of $50,000, to generally deal in sand and gravel. Benjamin Rastalli, Brooklyn, N. Y., is the president, and James B. Denny, Dickson Building, Norfolk, Va., is the attorney.

Northwest Talc & Magnesium Co., Bellingham, Wash., has filed articles of incorporation to mine a refractory material used for lining electric furnaces. The capital stock was listed at $20,000. Ira Marshall, Robert Maloy and Carl Field are the trustees.

Masholite Concrete Corp., Newark, N. J., has been incorporated with a capital of 1000 shares. F. D. Masucci is the agent.

H. B. Zachry Properties, Inc., a Delaware organization, has been granted a charter to engage in the gravel manufacturing business in Texas, with a capital of 1000 shares, no par value. H. B. Zachry is the agent, with headquarters in Laredo, Tex.

Gravel and Sand Operating Corp., Norfolk, Va., has been incorporated, with a maximum capital of $50,000, to deal in sand and gravel. Benjamin Rastalli, Brooklyn, N. Y., is the president, and James B. Denny, Dickson Bldg., Norfolk, is the attorney.

Dunham Concrete Co., Inc., Orlando, Fla., has been organized. Incorporator is H. L. Dunham.

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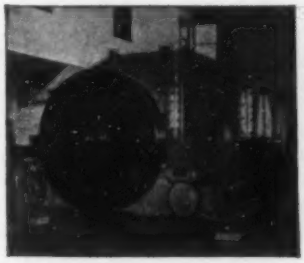

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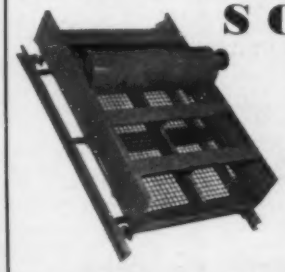

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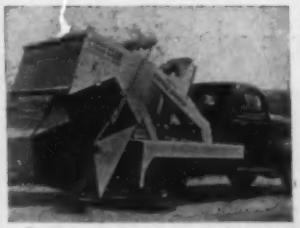

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DEMPSTER BROTHERS, Inc., Knoxville, Tenn.

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Of ROCK PRODUCTS, published monthly at Chicago, Illinois, for November 1, 1942.

State of Illinois, County of Cook, ss.

Before me, a notary public in and for the State and county aforesaid, personally appeared John R. Thompson, who, having been duly sworn according to law, deposes and says that he is the Business Manager of Rock Products and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are:

Publisher—Tradepress Publishing Corporation, 309 W. Jackson Blvd., Chicago, Ill.

Editor—Nathan C. Rockwood, 309 W. Jackson Blvd., Chicago, Ill.

Managing Editor—Ralph S. Torgerson, 309 W. Jackson Blvd., Chicago, Ill.

Business Manager—John R. Thompson, 309 W. Jackson Blvd., Chicago, Ill.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

Tradepress Publishing Corporation, 309 W. Jackson Blvd., Chicago, Ill. The stockholders of the Tradepress Publishing Corporation are John R. Thompson, 2511 Coyle Avenue, Chicago; J. L. Frazier, 2043 Orrington Ave., Evanston, Ill.; Col. J. B. Maclean, 7 Austin Terrace, Toronto, Ont., Canada; Horace T. Hunter, 120 Inglewood Drive, Toronto, Ont., Canada; The MacLean Publishing Co., Ltd., 481 University Avenue, Toronto, Ontario, Canada.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is: (This information is required from daily publications only.)

JOHN R. THOMPSON,
Business Manager.

Sworn to and subscribed before me this 18th day of September, 1942.

(Seal) M. E. JOHNSTON.

(My commission expires Oct. 20, 1945.)

Cement Production Up

BUREAU OF MINES reports that the portland cement industry in August, 1942, produced 17,605,000 bbl., shipped 21,282,000 bbl., and had in stock at the end of the month 15,295,000 bbl. Production and shipments of portland cement in August, 1942, showed increases of 7.7 and 19.4 percent, respectively, as compared with August, 1941. Portland cement stocks at mills were 22.5 percent lower than a year ago.

In the following statement of relation of production to capacity the total output of finished cement is compared with the estimated capacity of 153 plants at the close of August, 1942, and of 157 plants at the close of August, 1941.

RATIO (PERCENT) OF PRODUCTION TO CAPACITY

	August 1941	1942	July 1942	June 1942	May 1942
The month	77.0	85.0	80.0	79.0	77.0
12 months	61.0	73.0	71.0	71.0	71.0

Severance Tax Suit

R. E. JAMES GRAVEL CO., INC., is being sued by the attorney general of the State of Texas for $6,110 alleged to be due for sand and gravel removed from the Colorado River bed at Reed's Bend, under a State Game, Fish and Oyster Commission permit.

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2—40"x16" Colorado Iron Works.
1—42"x16" Allis-Chalmers Anaconda type.
1—30"x30" Jeffrey Single Roll Crusher.

BUCKET ELEVATORS

27' c/c—14x7; 29' c/c—14x7; 40'—7x5; 42'—10x6; 44'—7x5 belt; 70'—16x8; 90'—16x8; 3—100'—7x5, belt; all of these steel encased.

BELT CONVEYORS

5—18" Steel Frame in 15' sections, 4" cross channels, 6" long channels. Link-Belt troughing and return idlers, with anti-friction bearings; 50', 85', 100', 125', 150' centers.
1—24"x105' with wood frame.
1—30"x132' c/c with wood frame, anti-friction idlers.
3—18" Sandvik flat belt Conveyors, motor driven, with steel framework; 2—60' c/c; 1—80' c/c.

PAN CONVEYOR

1—24"x65' c/c Jeffrey Steel Pan Conveyor.

ROTARY DRYERS, Direct Heat
3'x20', 5x26', 5x30', 6x24', 6x50'.

ROTARY KILNS
4x30', 4x40', 8x80', 10x175'.

CENTRIFUGAL AIR SEPARATORS
1—10' dia. Sturtevant Mill Co.
2—14' dia. Gayco.

TUBE MILLS
2—7'x24' Smidth iron lined.

RAYMOND PULVERIZERS
2—5 roll high and low side, also No's. 0000, 1, 2.
5—Raymond Imp Pulverizers, also used for coal pulverizers; No's. 50, 55, 90.

VIBRATING SCREENS
1—4'x8' 2-deck, Allis-Chalmers, heavy duty.
4—4'x5' No. 39 Tyler Hummers, 2-deck. Other makes and sizes.

FOR 35 YEARS SYMBOL OF CONFIDENCE

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Shops and Yard at Newark, N. J., cover eight acres.

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1—Monighan Steam Dragline, skid and roller, 100' boom, 3½-yd. bucket. Butt-strapped boiler. 10½" x 12" main engine.

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Steel Tanks of All Kinds

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24 X 48 SINGLE ROLL PRIMARY OR COARSE REDUCTION
48" WIDE McLANAHAN RECIPROCATING FEEDER. HEAVY DUTY JEFFREY ELEVATOR 65 FOOT CENTERS
CONTINUOUS BUCKET 24" X 14" X 17¾"
6 TWO YARD KOPPEL STEEL 2-WAY DUMP CARS

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CONSTRUCTION TYPE ELECTRIC LOCOMOTIVES

2—4 Ton WESTINGHOUSE, 250 V., 36" Ga., Equipped with 902-C Motors, and complete with Motor Driven Cable Reels.

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(NEW)
(1) Gruendler 10 x 16 Roller Bearing Jaw Crusher.
(2) 24 x 18 Pulverizers.
(1) 30 x 24 Pulverizer.
(1) 32" Single Cage Gravel & Stone Crusher.
(1) 42" Fine Grinding Ring Roll Mill.
(1) 42 x 36 Pulverizer.

(USED AND REBUILT)
(1) Gruendler 15 x 24 Plain Bearing Blake Type Crusher.
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MARION Mod. 36, combination steam shovel crane and dragline—1½ yd. cap.
UNIVERSAL—¾ swing crane, cat mounted, 24-ft. boom, ¾ yd. capacity.
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2—SX-4 Hammermills STEELBUILT.
3—18"x24" Single Rolls STEELBUILT.
1—21"x40" Single Roll STEELBUILT.

These units are available on low Priorities. Prompt shipment. LET US KNOW YOUR REQUIREMENTS.

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Complete steam electric generating plant, including two 500 H. P. Sterling boilers, three 500 KVA and one 350 KVA turbine-driven generators, switch board, pumps, condensers, etc. Knocked down and easy to ship—shipping point, Southern Nevada. Address Box A-68, c/o ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago, Illinois.

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1—22 ton American 4 wheel saddle tank, code boiler, standard gauge, overhauled.
2—25 ton Porter 36" gauge saddle tanks, code boilers, built 1924-1926.
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Crane or Dragline Fronts for Marion 37 and Bucyrus 50-B, One Each.

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1—Stiff Leg Derrick, 50 Ft. Boom, 30 Ft. Mast.
1—Sullivan Drill Sharpener.
3—A. C. Motors, 20—40—50 HP.
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ELECTRIC: 478, 676, 807, 1362, 1722 & 2200 Ft.
DIESEL: 603, 807 & 1060 Ft.
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2 Yd. OWEN Type S Material Handling.
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18 Steel Skips 6½ x 6 x 2½.
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12 Ton NORTHWEST 50 Ft. Boom Gas.
20 Ton LIMA, 750 Diesel, 65 Ft. Boom.
25 Ton BROWNING & 30 Ton AMERICAN Loco.
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.

CATERPILLAR SHOVELS
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2 Yd. Marion Steam Shovel.
¾ Yd., 1¼ Yd., 2 Yd. & 4 Yd. MARION Electrics
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1¼ Yd. BUCYRUS 41B Steamer.
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46—KOPPEL 1½ Yd. 24 & 30 In. Ga., V Shaped.
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Gas: 15, 30, 60, 100 & 120 HP.
Electric: 30, 52, 90, 100 & 150 HP.
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75, 90, 180, 200 HP F. M. Engines.
110 HP Ingersoll Rand Engine.
175 KVA Worthington 3/60/2300.
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6x8 Pebble Mill & 5x5 Batch Mill.
5'x22" HARDINGE CON. Dry Ball Mill.
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4x16, 5x18 & 5x22 Tube Mills & 6'x22'.
3½ x 8 & 5x7 Air Swept Tube Mills.
2x4½, 6x12 & 5x12 ROD MILLS.

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116 Ton Raw Knox 2 Compt.

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400 Barrel Butler Portable Steel Cement Bin with Fuller automatic batcher, push button control.

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8, 10 and 14 ft. Separators, Gayco & Bradley.

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36x60 Fairmount & 36x20 Diamond.

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42 in. McCully Mammoth Gyratory.
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18 in.,24 in.,30 in.,36 in. and 48 in. Symons Disc.
4—10 TZ Traylor 4 ft. Gyratory.
4—Nos. 5, 3 & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory, also 16 inch 8 in. Traylor T. Gyratory.
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10 Inch Austin Model 105.
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100 K.W. RIDGWAY 3/60/2200-250-275 volt.
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200 K.W.RIDGWAY 3/60/2200-250-275v.,900 rpm.

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52 H. P. GEN. ELEC. 3/60/440 v., 1200 rpm.
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BELT: 1000 Ft.60 In., 700 Ft.40 In., 600 Ft.36 In., 800 Ft.30 In., 1642 Ft.24 In., 517 Ft.20 In., 297 Ft.18 In., 500 Ft.16 In., 300 Ft.14 In.
IDLERS: 54 In.,42 In.,36 In.,30 In., 24 In.,20 In.,18 In.,16 In. & 14 In.
Head & Tail—Pulleys—Takeup for all sizes.
Steel Frames: 2,000 Ft. 24 In.,30 In. & 36 In.Sections.

ROTARY DRYERS AND KILNS
36 In.x20 Ft.,3 Ft.x30 Ft., 4 Ft.x30 Ft., 54 In. x 30 Ft., 42 In.x24 Ft., 5 Ft.x30 Ft., 5 Ft.x16 Ft., 5 Ft.x60 Ft.,6 Ft.x60 Ft.,6 Ft. x 20 Ft., 6 Ft.x70 Ft.,10x20, 7½x100 & 8x110 Ft. Kilns.

STEEL DERRICKS
GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom,25 Ton 100 Ft.Boom,75 Ton 135 Ft.Boom.

LOCOMOTIVES
GASOLINE: 3 Ton,5 Ton,8 Ton,12,14,and 20 Ton.
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ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 40 Ton.
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HUMMER, ROTEX, NIAGARA & ROBINS.
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1—7 ton Whitcomb 36" gauge gasoline locomotive, type MO, power gasoline engine.

4—7 ton Plymouth type 2, Model D L 24" gauge locomotives power gasoline engines.

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30—Riveting Hammers, Thor, Ingersoll-Rand, Chicago-Pneumatic, Boyer, and Sullivan.

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Also a number of grinders, wood bores, and drifters.

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10—Air Drills, Chicago Pneumatic and Cleveland.

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2—Gardner-Denver wagon drills with 16' high derricks. Has hand winches for raising and lowering. Equipped with model No. 21 Gardner-Denver drills. Will channel 30' deep.

1—Ingersoll-Rand wagon drill with derrick mounted on four steel wheels, equipped with Ingersoll-Rand air hoist for steel drill. Has Ingersoll-Rand drifter broached for 1¼" steel.

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1—Mdl. 301 Koehring, ser. No. 544, with 45' boom.

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11—ATTACHMENTS
1—2 yd. Link Belt K 55.
1—1¼ yd. Link Belt K 42.
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1—1 yd. North-West 105.
1—¾ P & H 206.
All above are shovel attachments.
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For immediate sale, 1 Kennedy Van Saun Slugger Roll Crusher 36" x 48", 1 Rock Pan Feeder 42" x 13'9". 1 Kennedy Van Saun Hammer Mill Crusher 54" x 48". Same as new condition. Never been used. Overhead Structural Steel Crane Runway 780' long. Robins Conveying Belt Equipment for 30" system, troughing idlers, return idlers, gears, pulleys, etc. 1 Whitcomb Gasoline 10 Ton Locomotive. 1 Large Structural Steel Ore Bin. 3 Westinghouse Induction Motors and 3 Reduction Gears. Other items on hand. All bought new; never been in service.
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No. 19 Kennedy, 10-B Telsmith Gyratory Crushers.
No. 7½ Allis Chalmers Gyratory Crusher, excellent, with 60' continuous 18" bucket elevator.
24x36" Farrell and Allis-Chalmers, 24x30" Carroll.
2—10x20" Good Roads Jaw Crushers.
30"x52' Belt & 2—13"x30' Chain & Bucket Elevators.
Nos. 2 and 3 Symons Cone Crushers, coarse bowls.
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No. 0 Raymond Pulverizer, complete.
4—4-yd. Koppel 36" ga. Heavy duty Quarry Cars.
Shovels, Cranes, Compressors, Screens, etc.
350 HP, 250 V, DC Nat. Gas Eng. Gen. Set.

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CONVEYOR and TRANSMISSION BELTING

CONVEYOR BELTING
ABRASIVE RESISTANT COVERS

Width	Ply	Top	Covers
48"	—8	—1/8"	—1/16"
42"	—5	—1/8"	—1/16"
36"	—6	—1/8"	—1/16"
30"	—6	—1/8"	—1/16"
30"	—5	—1/8"	—1/16"
24"	—5	—1/8"	—1/32"
24"	—4	—1/8"	—1/32"
20"	—5	—1/8"	—1/32"
20"	—4	—1/8"	—1/32"
18"	—4	—1/8"	—1/32"
16"	—4	—1/8"	—1/32"
14"	—4	—1/16"	—1/32"
12"	—4	—1/16"	—1/32"

TRANSMISSION BELTING
HEAVY-DUTY—FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	—6	10"	—6	6"	—5
16"	—6	10"	—5	5"	—5
14"	—6	8"	—6	4"	—5
12"	—6	8"	—5	4"	—4
12"	—5	6"	—6	3"	—4

ELEVATOR BELTING
HEAVY DUTY
RUBBER COVERED

Width	Ply	Top	Covers
12"	—6	—1/16"	—1/16"
14"	—6	—1/16"	—1/16"
16"	—6	—1/16"	—1/16"
18"	—6	—1/16"	—1/16"

ENDLESS "V" BELTS
"A"—WIDTH—All Sizes
"B"—WIDTH—" "
"C"—WIDTH—" "
"D"—WIDTH—" "
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RUBBER HOSE
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GYRATORY: 42" Gates K. 30" Superior McCully (Like new). 20" Superior McCully. Gates Nos. 12, 10, 9, 8, 7½, 6, 5, 4, 3, 2, 1 (75 avail.) Telsmith Nos. 4, 5, 6, 8C, 9 & 16. Also many Austins, Kennedys and Traylors, many sizes.
JAW TYPE: Traylor 60x84, 48x60, 42x48, 24x72. Superior 84x66 & 24x36. Buchanan 30x42. Farrel 60x42, 30x36, 24x36, 15x36, 12x24. Good Roads 1030. Acme 24x40. Misc. 7x12, 9x16, 8x20, 8x24, 12x24, 9x36, 9x30, 15x36.
REDUC. TYPE: Kennedy Nos. 25, 27 & 49. Telsmith 2-F & 40. Traylor 36" T2, 8", 10", 12". Super. McCully 6" & 10". Newhouse 5, Y & 10". Symons Cone & Disc 7', 5' to 4'.
ROLLS: Allis-C. 12¼x12, 36x10, 40x15, 54x24 & 72x30. Fairmount 36x60 & Jeffrey 24x24 to 36x54 single roll. Cornish 36x14 & 42x16, Etc., Etc.
HAMMERMILLS: Williams No. 1, 2, 3, 4, 8 & 9. Jeffrey 36x18 & 36x42. Day Nos. 20 & 40., Etc.
MILLS: Kennedy Ball 4x6, 5x5 & 5x8. Marcy 6x6 & 10x9. Hardinge 6'x3', 3'x36' & 6'x9'. Misc. Tube Mills 5' & 6' x 22'. Sturtevant Ring Roll, Raymonds, Kents, Fuller-Lehigh, Etc., Etc.
CRUSHING PLANTS: No. 65 Diamond No. 22 Pioneer 8x14, 1630 Good Roads, 9x40 Austin-Western, 9x36 C.R.

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Barges, Bins, Buckets, Boilers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryer, Derricks, Draglines, Drag Scrapers, Dredges, Drills, Engines, Elevators, Excavators, Generators, Hoists, Kilns, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Slacklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices. (I have equipment at many points in the United States and Canada. What you need may be near your plant.)

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AIR COMPRESSORS

C-P 14x12", 529' belted 100 hp slip ring motor.
Schramm 4 cyl. 360' V drive 60 hp AC motor.
I-R 275', Waukesha engine, on skids.
I-R vertical hopper cooled 6x6", 44'.

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1000' 42" conveyor belt, 6 to 8 ply.
445' 30" conveyor belt, 6 ply.
86' 54" new conveyor belt, stepped 5-7 ply.
78 Robins 42" trough idlers, style 105.
25 S-W type Y 30" trough idlers.
100 selected head and tail pulleys.
250 selected drive pulleys and flywheels, 6" to 8'.
Cotton belt 12", 14", 18", 30", 48" face.
Scoop Portable conveyor, 14"x24', 3 hp electric.

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Farrell jaw crushers, 24x13"B and 15x9"A.
Champion jaw crusher 24x12".
Reliance jaw crusher 16"x9".
Traylor "Bulldog" 11" gyratory on wheels.
Williams No. 2 Semi Vulcanite Hammer Mill.
Marcy Continuous Roller Mill 2'x1', steel balls.
Double crushing rolls 24x16" and 42x16".
Crushing Roll 24"x24" with teeth.
American double crushing rolls 36"x30".
American Disintegrator, 18" & 24" x 30" rolls.

SCREENS

Leahy 4'x6' three deck direct motor driven.
Hummer 3x5' single and two deck, V20.
Revolving 2'x8', 2'x9', 30"x12', 4'x16', 42"x16'.

BUCKET ELEVATOR

60' Continuous elevator 8" buckets, Ley Bushed chain.
35' Continuous elevator 18" buckets, 2 strand chain.
40' Continuous elevator 29" low front buckets on belt.
40' Continuous elevator 30" buckets on 2 strands chain.
55' elevator 12" malleable buckets. Ley Bushed chain.
40' elevator 10" malleable buckets, Ley Bushed chain.
40' elevator 8" malleable buckets, H82 chain.
40' elevator 18" heavy Salem buckets, Ley Bushed chain.
Malleable and Salem buckets, 5" to 20".
Selected gears, sprockets, elevator and drive chain.

MISCELLANEOUS

75 hp F.M. Diesel engine, YV, 300 rpm.
2 Fairbanks-Morse Bulldog oil engines, 5 hp, 450 rpm.
National 2 drum 25 hp electric dragline hoist.
Two Sprague 10 ton AC electric car pullers.
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36" gauge 4 and 8 ton gasoline locomotives.
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28"x12' screw sand washer, V belt drive.
Revolving Dryer on trunions, 4' x 21'.
Kron Dial Scales, 2—250 lb. and 2—2000 lb.
Centrifugal pumps, motors, engines, air tanks.
Kochring batch mixer, ½ yard, on skids.
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Width	Ply	Width	Ply
1 to 48 inch	3	1 to 48 inch	6
1 to 48 inch	4	1 to 48 inch	8
1 to 48 inch	5		

ELEVATOR AND CONVEYOR BELTING FRICTION SURFACE BRANDED "TE-CO"

Width	Ply	Width	Ply
6 to 48 inch	3	10 to 48 inch	6
8 to 48 inch	4	12 to 48 inch	8
10 to 48 inch	5		

RUBBER COVERED CONVEYOR BELTING BRANDED "I'M GOOD"

Width	Ply	Top	Pulley
12	4	3/32	1/32
14	4	3/32	1/32
16	4	3/32	1/32
18	4	3/32	1/32
20	4	3/32	1/32
24	4	3/32	1/32
18	4	⅛	1/32
24	5	⅛	1/32
30	5	⅛	1/32

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ALL TRANSMISSION SIZES IN STOCK
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10—42x10 Cr.Cast Solid		400—12x4 Cr. Steel Sp.	
20—36x10 St. Steel Sp.		200—8x3 Cr.Cast Solid	
200—28x8 St. Steel Sp.		200—5x3 Cr.Cast Solid	

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No.	Drop	Size	Price	No.	Drop	Size	Price
75	9	1-11/16	$3.25	10	12	2-7/16	$4.40
200	18	1-15/16	4.25	15	14	2-7/16	5.50
80	20	1-15/16	5.00	60	16	2-7/16	6.00
20	22	1-15/16	5.65	40	18	2-7/16	6.50
50	24	1-15/16	6.35	70	20	2-7/16	7.00
8	27	1-15/16	7.50	400	22	2-7/16	8.00
40	18	2-3/16	5.00	500	24	2-7/16	8.50
200	20	2-3/16	6.00				

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750	Hyatt 1-15/16	$5.00 ea.
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25	S.K.F. 1-15/16	5.00 ea.
20	S.K.F. 2-7/16	10.00 ea.

NEW

Size Shaft	1-3/16	1-7/16	1-11/16	1-15/16
Ball Bearing	$11.50	$12.00	$13.50	$15.00
Ring Oiling	2.40	3.00	3.30	5.15

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Size Shaft	2-3/16	2-7/16	2-11/16	2-15/16
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CAST IRON MOULDED—ALL SIZES
CUT IRON AND STEEL—ALL SIZES
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1—4x1-AB		1.75	1—0½x3-C		13.90
1—4x3-A		3.00	1—0⅝x3-AB		5.95
1—4x4-A		3.65	1—0⅝x4-C		16.35
1—4⅛x1-AB		1.85	1—0⅝x6-AB		12.65
1—4⅛x3-A		3.15	1—10x2-C		11.65
2—4½x3-O		2.50	1—10x3-B		4.65
1—4⅝x2-AB		2.70	1—10¼x5-AB		5.90
1—5x1-AB		1.95	1—10⅝x2-AB		6.70
1—5x5-AB		4.85	1—11x2-C		12.50
1—5⅝x6-AB		5.75	2—12½x2-C		13.15
1—5½x2-AB		3.10	1—15½x2-C		16.25
1—5½x3-AB		3.70	1—16½x3-A		9.05
1—5⅝x3-AB		3.80	1—19x5-D		43.70
2—5⅝x2-AB		3.30	1—19x10-D		70.35
1—6x1-AB		2.35	2—19¾x2-C		18.50
1—6⅛x2-AB		3.50	1—20½x3-A		17.00
2—6⅛x3-AB		4.15	4—21⅝x2-C		20.75
1—6⅛x7-AB		8.75	2—23¼x2-C		22.50
1—6⅝x4-AB		5.50	4—26x2-C		24.75
1—7⅛x1-AB		2.65	3—31½x1-AB		16.35
1—7⅝x4-AB		6.35	9—31½x3-AB		23.75
1—9½x2-AB		4.65	1—37x4-C		48.00

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No.	Size	Price	No.	Size	Price
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3—8x4x1-7/16		9.60	5—16x4x1½		12.00
1—10x4x1-11/16		10.65	1—20x8x1-15/16		20.00
2—10x8x1-7/16		12.00	10—18x8x1-15/16		19.00
1—11x6x2-7/16		13.50	3—24x3½x 1-15/16		20.50
1—12x4x1-7/16		10.00			
1—12x6x1⅞		12.50			

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KNOCKOUT!
HIGH SCREEN COSTS
USE CLEVELAND "ALLOY" WIRE SCREENS
25 YEARS OF EXPERIENCE DOES COUNT
THE CLEVELAND WIRE CLOTH & MFG. CO.
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with GREATER PRODUCTION
SYMONS Cones are doing their part in increasing the production of our many strategic materials, particularly those metals and industrial minerals in which fine reduction crushing operations are involved.
In addition to regularly established stone, gravel and slag plants, Cones are also serving many newly built projects which are providing great quantities of materials quickly needed for ammunition plants, cantonments, storage facilities, docks, flying fields, air and naval bases, etc. Where quantity output of finely crushed material is desired, you can depend on Symons Cones to make a better product at lower cost.
NORDBERG MFG. CO.
MILWAUKEE WISCONSIN
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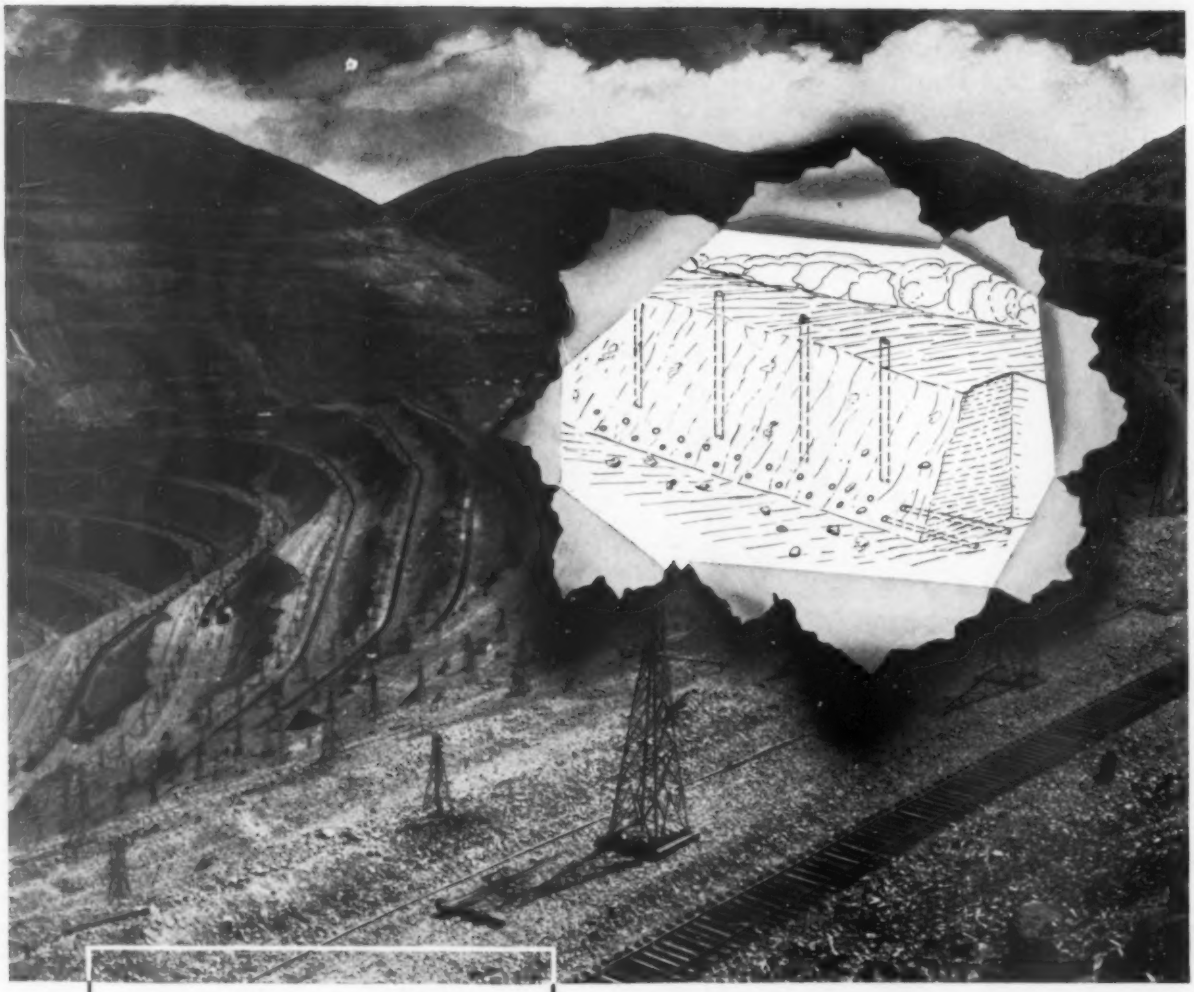
LONDON
TORONTO
SYMONS CONE CRUSHERS



Kick out the Toe with a Primacord Hookup

In cases where well drill holes are not drilled to the full depth of the face, a series of snake holes can be hooked up with Primacord and connected with the main blast so as to "go" at the same time.

Primacord-Bickford Detonating Fuse contains a core of PETN within a flexible, waterproof textile cover. Its flexibility and light weight promote ease of hookup; its powerful detonating wave insures strong detonation of each charge.

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SIMSBURY, CONNECTICUT

Manufacturers of Safety Fuse since 1836

PRIMACORD-BICKFORD DETONATING FUSE

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This is no time to have machine shutdowns. By lasting so much longer **TRU-LAY PREFORMED** reduces shutdown frequency and steadies production.

This is no time to have workmen laid up with blood-poisoned hands. Some operators have drastically reduced accidents by adopting American Cable **TRU-LAY PREFORMED**—the *safer* rope.

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American Cable engineers will gladly give you the benefit of their experience in helping you make your wire ropes last longer. All American Cable ropes made of Improved Plow Steel are identified by the Emerald Strand.

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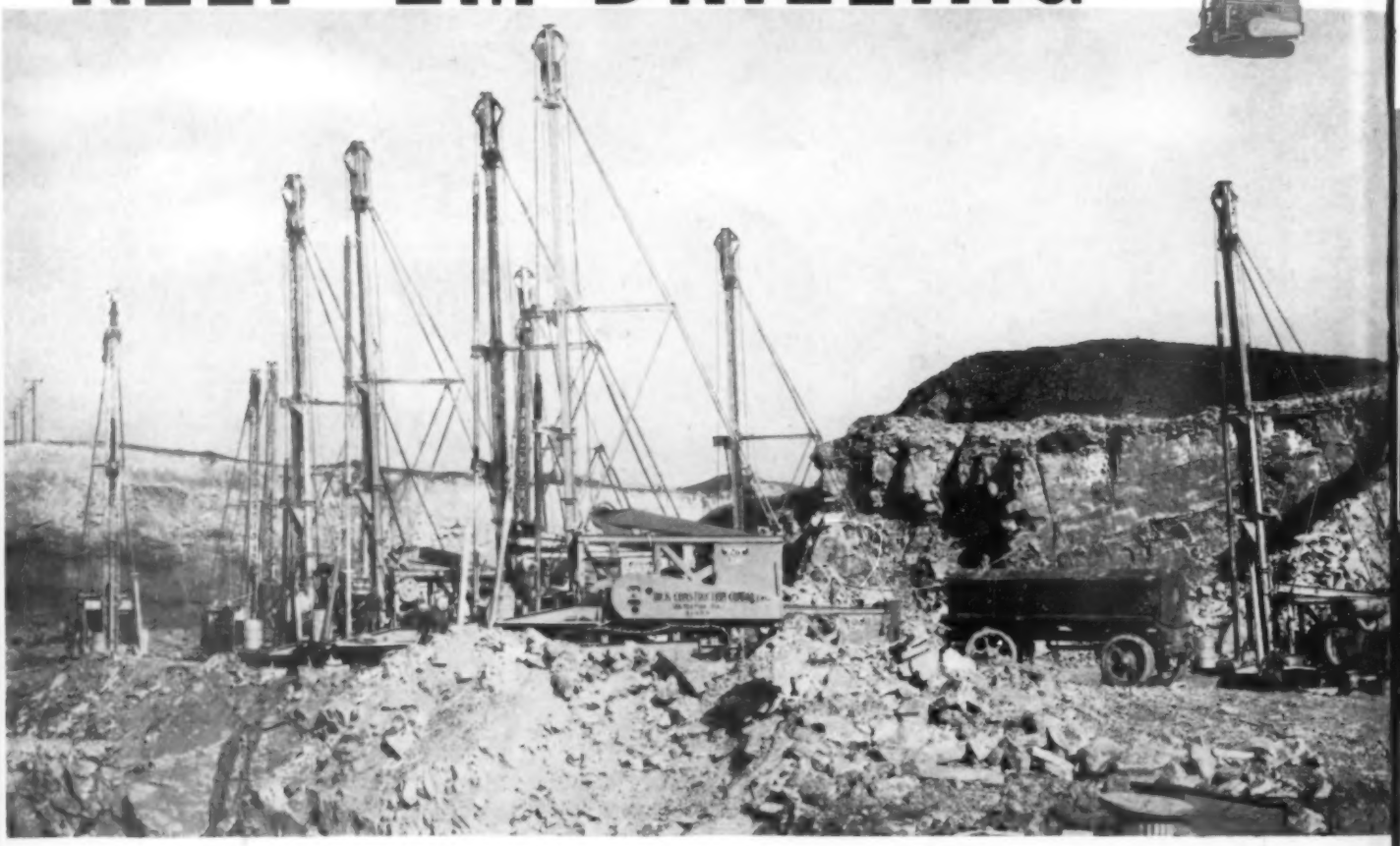
KEEP 'EM DRILLING



UNCLE SAM expects you to keep your drilling equipment at work. Doing so plays its part in keeping his factories working, his workers fed, his army and navy fighting. He's depending upon you to do the most with what you have, so that he'll have more to give to his forces.

Keep your drill performing better, make your equipment last longer:

1.

Watch your wire line: be careful to avoid kinks; keep it lubricated.

2.

Watch all bearings; see that they are tight; remove shims if necessary.

3.

Watch your drilling motion; keep it steady; maintain proper tension on your line.

4.

Watch your brakes and clutches; keep them carefully adjusted to improve operation and increase life of wearing parts.

5.

Watch your tools; don't feed them out too fast; it's better to drill with a tight line and let the tools reach out on the stretch and spring of the line and the shock absorber.

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DRILL FOR ★ ★ ★ VICTORY

Bucyrus-Eri

SOUTH MILWAUKEE, WISCONS